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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies the Radio Resource Control protocol for the radio interface between UE and E-UTRAN as well as for the radio interface between RN and E-UTRAN.

The scope of the present document also includes:

- the radio related information transported in a transparent container between source eNB and target eNB upon inter eNB handover;
- the radio related information transported in a transparent container between a source or target eNB and another system upon inter RAT handover.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.
- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] Void.
- [3] 3GPP TS 36.302: "Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer ".
- [4] 3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); UE Procedures in Idle Mode".
- [5] 3GPP TS 36.306 "Evolved Universal Terrestrial Radio Access (E-UTRA); UE Radio Access Capabilities".
- [6] 3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".
- [7] 3GPP TS 36.322:"Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Link Control (RLC) protocol specification".
- [8] 3GPP TS 36.323: "Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) Specification".
- [9] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRAN); Overall description; Stage 2".
- [10] 3GPP TS 22.011: "Service accessibility".
- [11] 3GPP TS 23.122: "Non-Access-Stratum (NAS) functions related to Mobile Station (MS) in idle mode".
- [12] 3GPP2 C.S0002-F v1.0: "Physical Layer Standard for cdma2000 Spread Spectrum Systems".
- [13] ITU-T Recommendation X.680 (07/2002) "Information Technology Abstract Syntax Notation One (ASN.1): Specification of basic notation" (Same as the ISO/IEC International Standard 8824-1).

[14]	ITU-T Recommendation X.681 (07/2002) "Information Technology - Abstract Syntax Notation One (ASN.1): Information object specification" (Same as the ISO/IEC International Standard 8824-2).
[15]	ITU-T Recommendation X.691 (07/2002) "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)" (Same as the ISO/IEC International Standard 8825-2).
[16]	3GPP TS 36.133: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements for support of radio resource management".
[17]	3GPP TS 25.101: "Universal Terrestrial Radio Access (UTRA); User Equipment (UE) radio transmission and reception (FDD)".
[18]	3GPP TS 25.102: "Universal Terrestrial Radio Access (UTRA); User Equipment (UE) radio transmission and reception (TDD)".
[19]	3GPP TS 25.331:"Universal Terrestrial Radio Access (UTRA); Radio Resource Control (RRC); Protocol specification".
[20]	3GPP TS 45.005: "Radio transmission and reception".
[21]	3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation".
[22]	3GPP TS 36.212: "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".
[23]	3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".
[24]	3GPP2 C.S0057-E v1.0: "Band Class Specification for cdma2000 Spread Spectrum Systems".
[25]	3GPP2 C.S0005-F v1.0: "Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems".
[26]	3GPP2 C.S0024-C v2.0: "cdma2000 High Rate Packet Data Air Interface Specification".
[27]	3GPP TS 23.003: "Numbering, addressing and identification".
[28]	3GPP TS 45.008: "Radio subsystem link control".
[29]	3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".
[30]	3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".
[31]	3GPP TS 36.401: "Evolved Universal Terrestrial Radio Access (E-UTRA); Architecture description".
[32]	3GPP TS 33.401: "3GPP System Architecture Evolution (SAE); Security architecture".
[33]	3GPP2 A.S0008-C v4.0: "Interoperability Specification (IOS) for High Rate Packet Data (HRPD) Radio Access Network Interfaces with Session Control in the Access Network"
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[35]	3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".
[36]	3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".
[37]	3GPP TS 23.041: "Technical realization of Cell Broadcast Service (CBS)".
[38]	3GPP TS 23.038: "Alphabets and Language".

- [39] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access (E-UTRAN); S1 Application Protocol (S1 AP)".
- [40] 3GPP TS 25.304: "Universal Terrestrial Radio Access (UTRAN); User Equipment (UE) procedures in idle mode and procedures for cell reselection in connected mode".
- [41] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [42] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception".
- [43] 3GPP TS 45.005: "GSM/EDGE Radio transmission and reception".
- [44] 3GPP2 C.S0087-A v2.0: "E-UTRAN cdma2000 HRPD Connectivity and Interworking Air Interface Specification"
- [45] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol".
- [46] 3GPP TS 25.223: "Spreading and modulation (TDD)".
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- [49] 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core network protocols; Stage 3".
- [50] 3GPP TS 45.010: "Radio subsystem synchronization".
- [51] 3GPP TS 23.272: "Circuit Switched Fallback in Evolved Packet System; Stage 2".
- [52] 3GPP TS 29.061: "Interworking between the Public Land Mobile Network (PLMN) supporting packet based services and Packet Data Networks (PDN)".
- [53] 3GPP2 C.S0097-0 v3.0: "E-UTRAN cdma2000 1x Connectivity and Interworking Air Interface Specification".
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- [59] 3GPP TS 22.368: "Service Requirements for Machine Type Communications; Stage 1".
- [60] 3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2".
- [61] 3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".
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- [64] IS-GPS-200F: "Navstar GPS Space Segment/Navigation User Segment Interfaces".

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- [68] 3GPP TS 23.303: "Proximity-based services (ProSe); Stage 2".
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- [71] 3GPP TS 36.314: "Evolved Universal Terrestrial Radio Access (E-UTRA); Layer 2-Measurements".
- [72] 3GPP TS 24.105: "Application specific Congestion control for Data Communication (ACDC) Management Object (MO)".
- [73] 3GPP TS 23.179: "Functional architecture and information flows to support mission critical communication services; Stage 2".
- [74] 3GPP TS 24.302: "Access to the 3GPP Evolved Packet Core (EPC) via non-3GPP access networks".
- [75] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses; Stage-2".
- [76] Wi-Fi Alliance® Technical Committee, Hotspot 2.0 Technical Task Group Hotspot 2.0 (Release 2) Technical Specification Version 3.11.
- [77] 3GPP TS 22.101: "Service aspects; Service principles".
- [78] 3GPP TS 23.285: "Technical Specification Group Services and System Aspects; Architecture enhancements for V2X services".
- [79] 3GPP TS 36.307: "Evolved Universal Terrestrial Radio Access (E-UTRA); Requirements on User Equipments (UEs) supporting a release-independent frequency band".
- [80] Military Standard WGS84 Metric MIL-STD-2401 (11 January 1994): "Military Standard Department of Defence World Geodetic System (WGS)".
- [81] 3GPP TS 37.340: "NR; Multi-connectivity; Overall description; Stage-2".
- [82] 3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol specification".
- [83] 3GPP TS 38.323: "NR; Packet Data Convergence Protocol (PDCP) Specification".
- [84] 3GPP TS 38.133: "NR; Requirements for support of radio resource management".
- [85] 3GPP TS 38.101-1: "NR; User Equipment (UE) radio transmission and reception; Part 1: Range 1 Standalone ".
- [86] 3GPP TS 33.501: "Security Architecture and Procedures for 5G System".
- [87] 3GPP TS 38.306: "NR; UE Radio Access Capabilities".
- [88] 3GPP TS 38.213: "NR; Physical layer procedures".
- [89] 3GPP TS 38.215: "NR; Physical layer measurements".
- [90] 3GPP TS 26.247: "Transparent end-to-end Packet-switched Streaming Service (PSS); Progressive Download and Dynamic Adaptive Streaming over HTTP (3GP-DASH)".
- [91] 3GPP TS 38.104: "NR; Base Station (BS) radio transmission and reception".

- [92] 3GPP TS 38.304: "NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state".
- [93] Bluetooth Special Interest Group: "Bluetooth Core Specification v5.0", December 2016.
- [94] 3GPP TS 37.213: "Physical layer procedures for shared spectrum channel access".
- [95] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".
- [96] 3GPP TS 22.261: "Service requirements for the 5G System".
- [97] 3GPP TS 37.324: "Service Data Adaptation Protocol (SDAP) specification".
- [98] ATIS 0700041: "WEA 3.0: Device-Based Geo-Fencing".
- [99] 3GPP TS 26.114: "IP Multimedia Subsystem (IMS); Multimedia Telephony; Media handling and interaction ".
- [100] 3GPP TS 38.101-2: "NR; User Equipment (UE) radio transmission and reception; Part 2: Range 2 Standalone ".
- [101] 3GPP TS 38.101-3: "NR; User Equipment (UE) radio transmission and reception; Part 3: Range 1 and Range 2 Interworking operation with other radios".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Anchor carrier: In NB-IoT, a carrier where the UE assumes that NPSS/NSSS/NPBCH/SIB-NB for FDD or NPSS/NSSS/NPBCH for TDD are transmitted.

Bandwidth Reduced: Refers to operation in downlink and uplink with a limited channel bandwidth of 6 PRBs.

Cellular IoT EPS Optimisation: Provides improved support of small data transfer, as defined in TS 24.301 [35].

Commercial Mobile Alert System: Public Warning System that delivers *Warning Notifications* provided by *Warning Notification Providers* to CMAS capable UEs.

Common access barring parameters: The common access barring parameters refer to the access class barring parameters that are broadcast in *SystemInformationBlockType2* outside the list of PLMN specific parameters (i.e. in *ac-BarringPerPLMN-List*).

Control plane CIoT EPS optimisation: Enables support of efficient transport of user data (IP, non-IP or SMS) over control plane via the MME without triggering data radio bearer establishment, as defined in TS 24.301 [35].

Control plane EDT: Early Data Transmission used with the Control plane CIoT EPS optimisation.

CSG member cell: A cell broadcasting the identity of the selected PLMN, registered PLMN or equivalent PLMN and for which the CSG whitelist of the UE includes an entry comprising cell's CSG ID and the respective PLMN identity.

Dual Connectivity: A UE in RRC_CONNECTED is configured with Dual Connectivity when configured with a Master and a Secondary Cell Group.

Early Data Transmission: Allows one uplink data transmission optionally followed by one downlink data transmission during the random access procedure as specified in TS 36.300 [9]. The S1 connection is established or resumed upon reception of the uplink data and may be released or suspended along with the transmission of the downlink data. Early data transmission refers to both CP-EDT and UP-EDT.

E-UTRA-NR Dual Connectivity: A form of dual connectivity in which a UE in RRC_CONNECTED is configured with MCG cells using E-UTRA and SCG cells using NR as defined in TS 37.340 [81].

EU-Alert: Public Warning System that delivers Warning Notifications provided by Warning Notification Providers using the same AS mechanisms as defined for CMAS.

Field: The individual contents of an information element are referred as fields.

Floor: Mathematical function used to 'round down' i.e. to the nearest integer having a lower or equal value.

Information element: A structural element containing a single or multiple fields is referred as information element.

Korean Public Alert System (KPAS): Public Warning System that delivers Warning Notifications provided by Warning Notification Providers using the same AS mechanisms as defined for CMAS.

Master Cell Group: For a UE not configured with DC, the MCG comprises all serving cells. For a UE configured with DC, the MCG concerns a subset of the serving cells comprising of the PCell and zero or more secondary cells.

Mixed Operation Mode: In NB-IoT FDD, multi-carrier operation where the anchor carrier is in standalone mode while the non-anchor carrier is in inband or guardand mode, and vice versa. See TS 36.300 [9].

MBMS service: MBMS bearer service as defined in TS 23.246 [56] (i.e. provided via an MRB or an SC-MRB).

NB-IoT: NB-IoT allows access to network services via E-UTRA with a channel bandwidth limited to 200 kHz.

NB-IoT UE: A UE that uses NB-IoT.

NCSG: Network controlled small gap as defined in TS 36.133 [16].

NR-E-UTRA Dual Connectivity (NE-DC): A form of dual connectivity in which a UE in RRC_CONNECTED is configured with MCG cells using NR and SCG cells using E-UTRA as defined in TS 37.340 [81].

Non-anchor carrier: In NB-IoT, a carrier where the UE does not assume that NPSS/NSSS/NPBCH/SIB-NB for FDD or NPSS/NSSS/NPBCH for TDD are transmitted.

NR Carrier Frequency: Frequency referring to the position of resource element RE=#0 (subcarrier #0) of resource block RB#10 of the SS block.

Primary Cell: The cell, operating on the primary frequency, in which the UE either performs the initial connection establishment procedure or initiates the connection re-establishment procedure, or the cell indicated as the primary cell in the handover procedure.

Primary Secondary Cell: The SCG cell in which the UE is instructed to perform random access or initial PUSCH transmission if random access procedure is skipped when performing the SCG change procedure.

Primary Timing Advance Group: Timing Advance Group containing the PCell or the PSCell.

PUCCH SCell: An SCell configured with PUCCH.

RLC bearer configuration: The lower layer part of the radio bearer configuration comprising the RLC and logical channel configurations.

Secondary Cell: A cell, operating on a secondary frequency, which may be configured once an RRC connection is established and which may be used to provide additional radio resources. Except for the case of (NG)EN-DC, the PSCell is considered to be an SCell.

Secondary Cell Group: For a UE configured with DC, the subset of serving cells not part of the MCG, i.e. comprising of the PSCell and zero or more other secondary cells.

Secondary Timing Advance Group: Timing Advance Group neither containing the PCell nor the PSCell. A secondary timing advance group contains at least one cell with configured uplink.

Serving Cell: For a UE in RRC_CONNECTED not configured with CA/ DC there is only one serving cell comprising of the primary cell. For a UE in RRC_CONNECTED configured with CA/ DC the term 'serving cells' is used to denote the set of one or more cells comprising of the primary cell and all secondary cells.

Sidelink: UE to UE interface for sidelink communication, V2X sidelink communication and sidelink discovery. The sidelink corresponds to the PC5 interface as defined in TS 23.303 [68].

Sidelink communication: AS functionality enabling ProSe Direct Communication as defined in TS 23.303 [68], between two or more nearby UEs, using E-UTRA technology but not traversing any network node. In this version, the terminology "sidelink communication" without "V2X" prefix only concerns PS unless specifically stated otherwise.

Sidelink discovery: AS functionality enabling ProSe Direct Discovery as defined in TS 23.303 [68], using E-UTRA technology but not traversing any network node.

Sidelink operation: Includes sidelink communication, V2X sidelink communication and sidelink discovery.

Split SRB: in MR-DC, an SRB between the MN and the UE, allowing selection of either the direct path or the path via the SN as well as duplication of RRC PDUs across both paths as defined in TS 37.340 [81].

Timing Advance Group: A group of serving cells that is configured by RRC and that, for the cells with an UL configured, use the same timing reference cell and the same Timing Advance value. A Timing Advance Group only includes cells of the same cell group i.e. it either includes MCG cells or SCG cells.

UE Inactive AS Context: UE Inactive AS Context is stored when the connection is suspended and restored when the connection is resumed. It includes information as defined in clause 5.3.8.7.

UE in CE: Refers to a UE that is capable of using coverage enhancement, and requires coverage enhancement mode to access a cell or is configured in a coverage enhancement mode.

User plane CIoT EPS optimisation: Enables support for change from EMM-IDLE mode to EMM-CONNECTED mode without the need for using the Service Request procedure, as defined in TS 24.301 [35].

User plane EDT: Early Data Transmission used with the User plane CIoT EPS optimisation.

V2X Sidelink communication: AS functionality enabling V2X Communication as defined in TS 23.285 [78], between nearby UEs, using E-UTRA technology but not traversing any network node.

Abbreviations 3.2

For the purposes of the present document, the abbreviations given in TR 21.905 [1], TS 36.300 [9] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1] or TS 36.300 [9].

1 DTT	
1xRTT	CDMA2000 1x Radio Transmission Technology
AB	Access Barring
ACDC	Application specific Congestion control for Data Communication
ACK	Acknowledgement
AILC	Assistance Information bit for Local Cache
AM	Acknowledged Mode
ANDSF	Access Network Discovery and Selection Function
ARQ	Automatic Repeat Request
AS	Access Stratum
ASN.1	Abstract Syntax Notation One
AUL	Autonomous Uplink
BCCH	Broadcast Control Channel
BCD	Binary Coded Decimal
BCH	Broadcast Channel
BL	Bandwidth reduced Low complexity
BLER	Block Error Rate
BR	Bandwidth Reduced
BR-BCCH	Bandwidth Reduced Broadcast Control Channel
CA	Carrier Aggregation
CBR	Channel Busy Ratio
CCCH	Common Control Channel
CCO	Cell Change Order
CE	Coverage Enhancement
CG	Cell Group
CIoT	Cellular IoT
CMAS	Commercial Mobile Alert Service
CP	Control Plane
Ci	

CP-EDT	Control Plane EDT
C-RNTI	Cell RNTI
CRS	Cell-specific Reference Signal
CSFB	CS fallback
CSG	Closed Subscriber Group
CSI	Channel State Information
DC	Dual Connectivity
DCCH	Dedicated Control Channel
DCI	Downlink Control Information
DCN	Dedicated Core Networks
DFN	Direct Frame Number
DL	Downlink
DL-SCH	Downlink Shared Channel
DRB	(user) Data Radio Bearer
DRX	Discontinuous Reception
DTCH	Dedicated Traffic Channel
EAB	Extended Access Barring
eDRX	Extended DRX
EDT	Early Data Transmission
EHPLMN	Equivalent Home Public Land Mobile Network
eIMTA	Enhanced Interference Management and Traffic Adaptation
ENB	Evolved Node B
EN-DC	E-UTRA NR Dual Connectivity with E-UTRAN connected to EPC
EPC	Evolved Packet Core
EPDCCH	Enhanced Physical Downlink Control Channel
EPS	Evolved Packet System
ETWS	Earthquake and Tsunami Warning System
E-UTRA	Evolved Universal Terrestrial Radio Access
E-UTRA/5GC	E-UTRA connected to 5GC
E-UTRA/EPC	E-UTRA connected to EPC
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
FDD	Frequency Division Duplex
FFS	For Further Study
GERAN	GSM/EDGE Radio Access Network
GNSS	Global Navigation Satellite System
G-RNTI	Group RNTI
GSM	Global System for Mobile Communications
HARQ	Hybrid Automatic Repeat Request
HFN	Hyper Frame Number
HPLMN	Home Public Land Mobile Network
HRPD	CDMA2000 High Rate Packet Data
HSDN	High Speed Dedicated Network
H-SFN	Hyper SFN
IDC	In-Device Coexistence
IE	Information element
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IoT	Internet of Things
ISM	Industrial, Scientific and Medical
kB	Kilobyte (1000 bytes)
L1	Layer 1
L2	Layer 2
L3	Layer 3
LAA	Licensed-Assisted Access
LWA	LTE-WLAN Aggregation
LWAAP	LTE-WLAN Aggregation Adaptation Protocol
LWIP	LTE-WLAN Radio Level Integration with IPsec Tunnel
LWIP MAC	LTE-WLAN Radio Level Integration with IPsec Tunnel Medium Access Control
MAC	Medium Access Control Multimedia Broadcast Multicast Service
MAC MBMS	Medium Access Control
MAC MBMS MBSFN	Medium Access Control Multimedia Broadcast Multicast Service Multimedia Broadcast multicast service Single Frequency Network

MCPTT	Mission Critical Push To Talk
MDT	Minimization of Drive Tests
MIB	Master Information Block
MO	Mobile Originating
MPDCCH	MTC Physical Downlink Control Channel
MRB	MBMS Point to Multipoint Radio Bearer
MR-DC	Multi-Radio Dual Connectivity
MRO	Mobility Robustness Optimisation
MSI	MCH Scheduling Information
MT	Mobile Terminating
MTSI	Multimedia Telephony Service for IMS
MUST	MultiUser Superposition Transmission
N/A	Not Applicable
NACC	Network Assisted Cell Change
NAICS	Network Assisted Interference Cancellation/Suppression
NAS	Non Access Stratum
NB-IoT	NarrowBand Internet of Things
NE-DC	NR E-UTRA Dual Connectivity
(NG)EN-DC	E-UTRA NR Dual Connectivity (i.e. covering both EN-DC and NGEN-DC)
NGEN-DC	E-UTRA NR Dual Connectivity with E-UTRAN connected to 5GC
NPBCH	Narrowband Physical Broadcast channel
NPDCCH	Narrowband Physical Downlink Control channel
NPDSCH	Narrowband Physical Downlink Shared channel
NPRACH	Narrowband Physical Random Access channel
NPSS	Narrowband Primary Synchronization Signal
NPUSCH	Narrowband Physical Uplink Shared channel
NR	NR Radio Access
NRS	Narrowband Reference Signal
NSSAI	Network Slice Selection Assistance Information
NSSS	Narrowband Secondary Synchronization Signal
OS	OFDM Symbol
P2X	Pedestrian-to-Everything
PCCH	Paging Control Channel
PCell	Primary Cell
PDCCH	Physical Downlink Control Channel
PDCP	Packet Data Convergence Protocol
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
PMK	Pairwise Master Key
PO	Paging Occasion
posSIB	Positioning SIB
ProSe	Proximity based Services
PS	Public Safety (in context of sidelink), Packet Switched (otherwise)
PSCell	Primary Secondary Cell
PSK	Pre-Shared Key
PTAG	Primary Timing Advance Group
PUCCH	Physical Uplink Control Channel
QCI	QoS Class Identifier
QoE	Quality of Experience
QoS	Quality of Service
RACH	Random Access CHannel
RAI	Release Assistance Indication
RAT	Radio Access Technology
RB	Radio Bearer
RCLWI	RAN Controlled LTE-WLAN Integration
RLC	Radio Link Control
RMTC	RSSI Measurement Timing Configuration
RN	Relay Node
RNA	RAN-based Notification Area
RNAU	RAN-based Notification Area Update
RNTI	Radio Network Temporary Identifier
ROHC	RObust Header Compression

	Desisten d Dublis I and Mabile Materials
RPLMN	Registered Public Land Mobile Network Radio Resource Control
RRC	
RSCP	Received Signal Code Power
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
RSS	Resynchronisation signal
RSSI	Received Signal Strength Indicator
SAE	System Architecture Evolution
SAP	Service Access Point
SBAS	Satellite Based Augmentation System
SC II	Sidelink Control
SCell	Secondary Cell
SCG	Secondary Cell Group
SC-MRB	Single Cell MRB
SC-RNTI	Single Cell RNTI
SD-RSRP	Sidelink Discovery Reference Signal Received Power
SFN	System Frame Number
SI	System Information
SIB	System Information Block
SI-RNTI	System Information RNTI
SL	Sidelink
SLSS	Sidelink Synchronisation Signal
SMC	Security Mode Control
SPDCCH	Short PDCCH
SPS	Semi-Persistent Scheduling
SPT	Short Processing Time
SPUCCH	Short PUCCH
SR	Scheduling Request
SRB	Signalling Radio Bearer
S-RSRP	Sidelink Reference Signal Received Power
SSAC	Service Specific Access Control
SSTD	SFN and Subframe Timing Difference
STAG	Secondary Timing Advance Group
S-TMSI	SAE Temporary Mobile Station Identifier
STTI	Short TTI
TA	Tracking Area
TAG	Timing Advance Group
TDD	Time Division Duplex
TDM	Time Division Multiplexing
TM	Transparent Mode
TPC-RNTI	Transmit Power Control RNTI
T-RPT	Time Resource Pattern of Transmission
TTI	Transmission Time Interval
TTT	Time To Trigger
UDC	Uplink Data Compression
UE	User Equipment
UICC	Universal Integrated Circuit Card
UL	Uplink
UL-SCH	Uplink Shared Channel
UM	Unacknowledged Mode
UP	User Plane
UP-EDT	User Plane EDT
UTC	Coordinated Universal Time
UTRAN	Universal Terrestrial Radio Access Network
V2X	Vehicle-to-Everything
VoLTE	Voice over Long Term Evolution
WLAN	Wireless Local Area Network
WT	WLAN Termination
WUS	Wake-up Signal

In the ASN.1, lower case may be used for some (parts) of the above abbreviations e.g. c-RNTI.

4 General

4.1 Introduction

In this specification, (parts of) procedures and messages specified for the UE equally apply to the RN for functionality necessary for the RN. There are also (parts of) procedures and messages which are only applicable to the RN in its communication with the E-UTRAN, in which case the specification denotes the RN instead of the UE. Such RN-specific aspects are not applicable to the UE.

This specification covers MR-DC i.e. the case in which the UE is configured with resources belonging to another node using NR RAT. The NR related configuration is performed using NR RRC as specified in TS 38.331 [82].

NB-IoT is a non backward compatible variant of E-UTRAN supporting a reduced set of functionality. In this specification, (parts of) procedures and messages specified for the UE equally apply to the UE in NB-IoT. There are also some features and related procedures and messages that are not supported by UEs in NB-IoT.

In particular, the following features are not supported in NB-IoT and corresponding procedures and messages do not apply to the UE in NB-IoT:

- Connected mode mobility (Handover and measurement reporting);
- Inter-RAT cell reselection or inter-RAT mobility in connected mode;
- E-UTRA connected to 5GC;
- RRC_INACTIVE;
- CSG;
- Relay Node (RN);
- Carrier Aggregation (CA);
- Dual connectivity (DC);
- Multi-Radio Dual Connectivity (MR-DC);
- PDCP duplication;
- GBR (QoS);
- ACB, EAB, SSAC and ACDC;
- MBMS, except for MBMS via SC-PTM in Idle mode;
- Self-configuration and self-optimisation;
- Measurement logging and reporting for network performance optimisation;
- Public warning systems e.g. CMAS, ETWS and PWS;
- Broadcast of positioning assistance data;
- Real time services (including emergency call);
- CS services and CS fallback;
- In-device coexistence;
- RAN assisted WLAN interworking;
- Network-assisted interference cancellation/suppression;
- Sidelink (including direct communication and direct discovery).

NOTE: In regard to mobility, NB-IoT is a separate RAT from E-UTRAN.

In this specification, there are also (parts of) procedures and messages which are only applicable to UEs in NB-IoT, in which case this is stated explicitly.

This specification is organised as follows:

- clause 4.2 describes the RRC protocol model;
- clause 4.3 specifies the services provided to upper layers as well as the services expected from lower layers;
- clause 4.4 lists the RRC functions;
- clause 5 specifies RRC procedures, including UE state transitions;
- clause 6 specifies the RRC message in a mixed format (i.e. tabular & ASN.1 together);
- clause 7 specifies the variables (including protocol timers and constants) and counters to be used by the UE;
- clause 8 specifies the encoding of the RRC messages;
- clause 9 specifies the specified and default radio configurations;
- clause 10 specifies the RRC messages transferred across network nodes;
- clause 11 specifies the UE capability related constraints and performance requirements.

4.2 Architecture

4.2.1 UE states and state transitions including inter RAT

A UE is in RRC_CONNECTED when an RRC connection has been established or in RRC_INACTIVE (if the UE is connected to 5GC) when RRC connection is suspended. If this is not the case, i.e. no RRC connection is established, the UE is in RRC_IDLE state. The RRC states can further be characterised as follows:

- RRC_IDLE:

- A UE specific DRX may be configured by upper layers (not applicable for NB-IoT);
- UE controlled mobility;
- The UE:
 - Monitors a Paging channel to detect incoming calls (by CN paging), system information change, for ETWS capable UEs, ETWS notification, and for CMAS capable UEs, CMAS notification;
 - Performs neighbouring cell measurements and cell (re-)selection;
 - Acquires system information.
 - Performs logging of available measurements together with location and time for logged measurement configured UEs.
 - May perform EDT.

- RRC_INACTIVE:

- A UE specific DRX may be configured by upper layers or by RRC layer;
- A RAN-based notification area is configured by RRC layer;
- The UE stores the UE Inactive AS context;
- The UE:
 - Applies RRC_IDLE procedures unless specified otherwise;

- Monitors a Paging channel for CN paging using 5G-S-TMSI and RAN paging using fullI-RNTI;
- Performs periodic RAN-based notification area update;
- Performs RAN-based notification area update when moving out of the configured RAN-based notification area;

- RRC_CONNECTED:

- Transfer of unicast data to/from UE.
- At lower layers, the UE may be configured with a UE specific DRX.
- For UEs supporting CA, use of one or more SCells, aggregated with the PCell, for increased bandwidth;
- For UEs supporting DC, use of one SCG, aggregated with the MCG, for increased bandwidth;
- For UEs supporting (NG)EN-DC, option to configure one NR SCG in conjunction with the MCG for DRBs and SRBs, for improved performance (SRBs) and increased bandwidth (DRBs);
- For UEs supporting NE-DC, option to configure one SCG in conjunction with the NR MCG for DRBs and SRBs, for improved performance (SRBs) and increased bandwidth (DRBs);
- Network controlled mobility, i.e. handover and cell change order with optional network assistance (NACC) to GERAN (not applicable for NB-IoT);
- The UE:
 - Monitors a Paging channel and/ or System Information Block Type 1 contents to detect system information change, for ETWS capable UEs, ETWS notification, and for CMAS capable UEs, CMAS notification (not applicable for BL UEs, UEs in CE and NB-IoT UEs);
 - Monitors control channels associated with the shared data channel to determine if data is scheduled for it;
 - Provides channel quality and feedback information (not applicable for NB-IoT);
 - Performs neighbouring cell measurements and measurement reporting (not applicable for NB-IoT);
 - Acquires system information (not applicable for BL UEs, UEs in CE and NB-IoT UEs).
- NOTE: The term "UE is connected to 5GC" covers the scenarios that the UE is connected to 5GC and the UE is requesting to connect with 5GC.

Figure 4.2.1-1 not only provides an overview of the RRC states in E-UTRA/EPC, but also illustrates the mobility support between E-UTRA/EPC, UTRAN and GERAN.

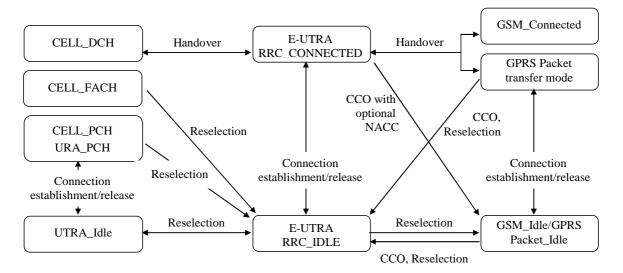


Figure 4.2.1-1: E-UTRA/EPC states and inter RAT mobility procedures, 3GPP

Figure 4.2.1-2 illustrates the mobility support between E-UTRA/EPC, CDMA2000 1xRTT and CDMA2000 HRPD. The details of the CDMA2000 state models are out of the scope of this specification.

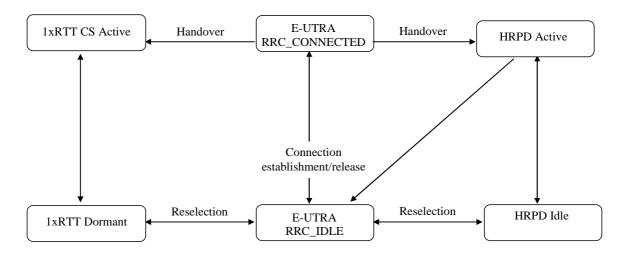


Figure 4.2.1-2: Mobility procedures between E-UTRA/EPC and CDMA2000

Figure 4.2.1-3 not only provides an overview of the RRC states in E-UTRA/5GC, but also illustrates the mobility support between E-UTRA/5GC, UTRAN and GERAN.

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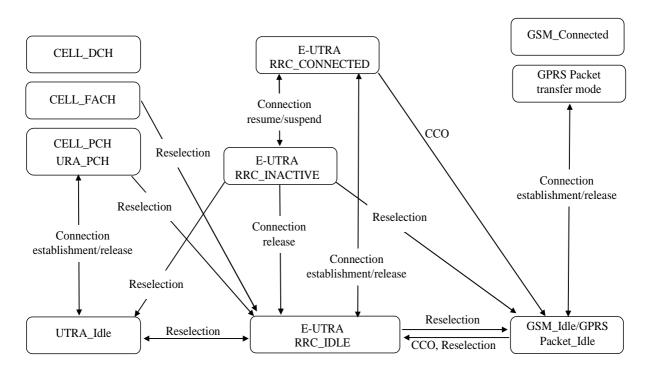


Figure 4.2.1-3: E-UTRA/5GC states and inter RAT mobility procedures, 3GPP

Figure 4.2.1-4 illustrates the mobility procedures supported between E-UTRA/5GC, CDMA2000 1xRTT and CDMA2000 HRPD. The details of the CDMA2000 state models are out of the scope of this specification.

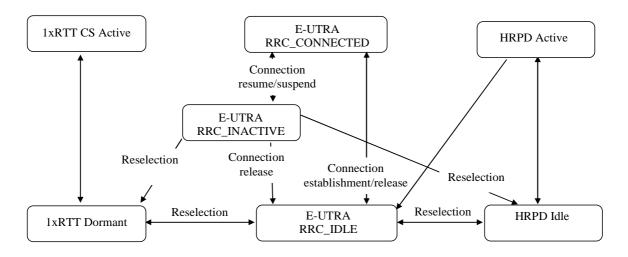


Figure 4.2.1-4: Mobility procedures between E-UTRA/5GC and CDMA2000

Figure 4.2.1-5 illustrates the mobility procedures supported between E-UTRA/5GC and E-UTRA/EPC.

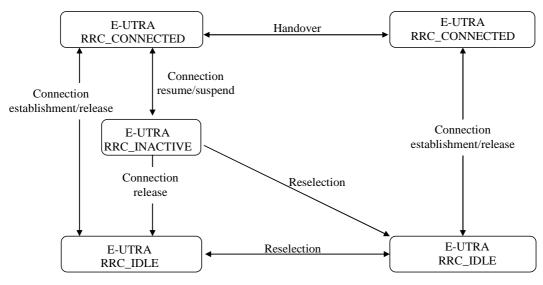


Figure 4.2.1-5: Mobility procedures between E-UTRA/5GC and E-UTRA/EPC

Figure 4.2.1-6 illustrates the mobility procedures supported between E-UTRA/EPC, E-UTRA/5GC and NR.

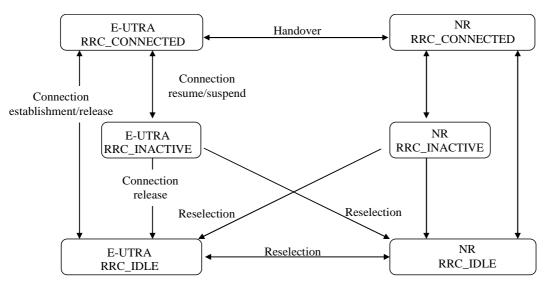


Figure 4.2.1-6: Mobility procedures between E-UTRA/EPC, E-UTRA/5GC and NR

The inter-RAT handover procedure(s) supports the case of signalling, conversational services, non-conversational services and combinations of these.

In addition to the state transitions shown in figures above, there is support for connection release with redirection information from E-UTRA RRC_CONNECTED to GERAN, UTRAN, CDMA2000 (HRPD Idle/ 1xRTT Dormant mode) and NR. A UE in RRC_INACTIVE enters RRC_IDLE when it enters another RAT or switches to another CN type.

For NB-IoT, mobility between E-UTRA and UTRAN, GERAN and between E-UTRA and CDMA2000 1xRTT and CDMA2000 HRPD is not supported at AS level and hence only the E-UTRA states depicted in Figure 4.2.1-1 are applicable.

4.2.2 Signalling radio bearers

"Signalling Radio Bearers" (SRBs) are defined as Radio Bearers (RB) that are used only for the transmission of RRC and NAS messages. More specifically, the following SRBs are defined:

- SRB0 is for RRC messages using the CCCH logical channel;
- SRB1 is for RRC messages (which may include a piggybacked NAS message) as well as for NAS messages prior to the establishment of SRB2, all using DCCH logical channel;
- For NB-IoT, SRB1bis is for RRC messages (which may include a piggybacked NAS message) as well as for NAS messages prior to the activation of security, all using DCCH logical channel;
- SRB2 is for RRC messages which include logged measurement information as well as for NAS messages, all using DCCH logical channel. SRB2 has a lower-priority than SRB1 and is always configured by E-UTRAN after security activation. SRB2 is not applicable for NB-IoT;
- SRB4 is for RRC messages which include application layer measurement reporting information, all using DCCH logical channel. SRB4 can only be configured by E-UTRAN after security activation. SRB4 is not applicable for NB-IoT.

In downlink piggybacking of NAS messages is used only for one dependant (i.e. with joint success/ failure) procedure: bearer establishment/ modification/ release. In uplink NAS message piggybacking is used only for transferring the initial NAS message during connection setup.

NOTE 1: The NAS messages transferred via SRB2 are also contained in RRC messages, which however do not include any RRC protocol control information.

Once security is activated, all RRC messages on SRB1, SRB2 and SRB4, including those containing NAS or non-3GPP messages, are integrity protected and ciphered by PDCP. NAS independently applies integrity protection and ciphering to the NAS messages.

For a UE configured with DC, all RRC messages, regardless of the SRB used and both in downlink and uplink, are transferred via the MCG. In case of EN-DC, after connection establishment NR PDCP may be configured for both SRB1 and SRB2 and if so, these SRBs may be configured as split SRB. In case of NE-DC, NR PDCP is always configured. For a split SRB, the UE receives RRC messages via both MCG and NR SCG i.e. handles out of order and duplicate PDUs as specified in TS 38.323 [83]. For a split SRB, the network configures via which cell group(s) the UE sends uplink RRC messages.

An SRB can be configured with PDCP duplication, either by two logical channels within the same CG (CA duplication) or by two logical channels each within a different CG (DC duplication).

4.3 Services

4.3.1 Services provided to upper layers

The RRC protocol offers the following services to upper layers:

- Broadcast of common control information;
- Broadcast of positioning assistance data;
- Notification of UEs in RRC_IDLE and RRC_INACTIVE, e.g. about a terminating call, for ETWS, for CMAS;
- Transfer of dedicated control information, i.e. information for one specific UE.

NOTE 2: In case of (NG)EN-DC, SRB3 may be configured for the transfer of some NR RRC messages between UE and SgNB via the NR radio interface, see TS 38.331 [82].

4.3.2 Services expected from lower layers

In brief, the following are the main services that RRC expects from lower layers:

- PDCP: integrity protection and ciphering;
- RLC: reliable and in-sequence transfer of information, without introducing duplicates and with support for segmentation and concatenation.

Further details about the services provided by Packet Data Convergence Protocol layer (e.g. integrity and ciphering) are provided in TS 36.323 [8]. The services provided by Radio Link Control layer (e.g. the RLC modes) are specified in TS 36.322 [7]. Further details about the services provided by Medium Access Control layer (e.g. the logical channels) are provided in TS 36.321 [6]. The services provided by physical layer (e.g. the transport channels) are specified in TS 36.302 [3].

4.4 Functions

The RRC protocol includes the following main functions:

- Broadcast of system information:
 - Including NAS common information;
 - Information applicable for UEs in RRC_IDLE, e.g. cell (re-)selection parameters, neighbouring cell information and information (also) applicable for UEs in RRC_CONNECTED, e.g. common channel configuration information;
 - Including ETWS notification, CMAS notification (not applicable for NB-IoT);
 - Including positioning assistance data.
- RRC connection control:
 - Paging;
 - Establishment/ modification/ suspension / resumption / release of RRC connection, including e.g. assignment/ modification of UE identity (C-RNTI), establishment/ modification/ suspension/ resumption/ release of SRB1, SRB1bis, SRB2 and SRB4, access class barring;
 - Initial security activation, i.e. initial configuration of AS integrity protection (SRBs) and AS ciphering (SRBs, DRBs);
 - For RNs, configuration of AS integrity protection for DRBs;
 - RRC connection mobility including e.g. intra-frequency and inter-frequency handover, associated security handling, i.e. key/ algorithm change, specification of RRC context information transferred between network nodes;
- NOTE 1: In NB-IoT, only key change (but no re-keying) at RRC Connection Resumption and RRC context information transfer are applicable.
 - Establishment/ modification/ release of RBs carrying user data (DRBs);
 - Radio configuration control including e.g. assignment/ modification of ARQ configuration, HARQ configuration;
 - For RNs, RN-specific radio configuration control for the radio interface between RN and E-UTRAN;
 - In case of CA, cell management including e.g. change of PCell, addition/ modification/ release of SCell(s) and addition/modification/release of STAG(s);
 - In case of DC, cell management including e.g. change of PSCell, addition/ modification/ release of SCG cell(s) and addition/modification/release of SCG TAG(s).

- In case of (NG)EN-DC, transparent transfer of NR RRC messages (e.g. DL: reconfiguration messages used to add or modify the NR SCG configuration or to (re-)configure measurements; UL: measurement reports and reconfiguration complete messages) and of configurations of radio bearers using NR PDCP.
- QoS control including assignment/ modification of semi-persistent scheduling (SPS) configuration information for DL and UL, assignment/ modification of parameters for UL rate control in the UE, i.e. allocation of a priority and a prioritised bit rate (PBR) for each RB (not applicable for NB-IoT);
- Recovery from radio link failure;
- In case of LWA, RCLWI and LWIP, WLAN mobility set management including e.g. addition/ modification/ release of WLAN(s) from the WLAN mobility set;
- Inter-RAT mobility including e.g. security activation, transfer of RRC context information (not applicable for NB-IoT);
- Measurement configuration and reporting (not applicable for NB-IoT):
 - Establishment/ modification/ release of measurements (e.g. intra-frequency, inter-frequency and inter- RAT measurements);
 - Setup and release of measurement gaps;
 - Measurement reporting;
- Other functions including e.g. transfer of dedicated NAS information and non-3GPP dedicated information, transfer of UE radio access capability information, support for E-UTRAN sharing (multiple PLMN identities);
- Generic protocol error handling;
- Support of self-configuration and self-optimisation (not applicable for NB-IoT);
- Support of measurement logging and reporting for network performance optimisation, as specified in TS 37.320 [60] (not applicable for NB-IoT);

NOTE 2: Random access is specified entirely in the MAC including initial transmission power estimation.

4.5 Data available for transmission for NB-IoT

For the purpose of MAC Data Volume and Power Headroom reporting, the NB-IoT UE shall consider the following as data available for transmission in the RRC layer:

- For SDUs to be submitted to lower layers:
 - the SDU itself, if the SDU has not yet been processed by RRC, or
 - the PDU if the SDU has been processed by RRC; or
- The data available for transmission in upper layers not submitted to the RRC layer.

5 Procedures

5.1 General

5.1.1 Introduction

The procedural requirements are structured according to the main functional areas: system information (5.2), connection control (5.3), inter-RAT mobility (5.4) and measurements (5.5). In addition, clause 5.6 covers other aspects e.g. NAS dedicated information transfer, UE capability transfer, clause 5.7 specifies the generic error handling, clause 5.8 covers MBMS (i.e. MBMS service reception via MRB), clause 5.8a covers SC-PTM (i.e. MBMS service reception via SC-MRB), clause 5.9 covers RN-specific procedures and clause 5.10 covers sidelink.

For NB-IoT, only a subset of the above procedural requirements applies: system information (5.2), connection control (5.3), some part of other aspects (5.6), general error handling (5.7), and SC-PTM (5.8a). Clauses inter-RAT mobility (5.4), measurements (5.5), MBMS (5.8), RN procedures (5.9) and Sidelink (5.10) are not applicable in NB-IoT.

5.1.2 General requirements

The UE shall:

- 1> process the received messages in order of reception by RRC, i.e. the processing of a message shall be completed before starting the processing of a subsequent message;
- NOTE 1: E-UTRAN may initiate a subsequent procedure prior to receiving the UE's response of a previously initiated procedure.
- 1> within a clause execute the steps according to the order specified in the procedural description;
- 1> consider the term 'radio bearer' (RB) to cover SRBs and DRBs but not MRBs or SC-MRBs unless explicitly stated otherwise;
- 1> set the *rrc-TransactionIdentifier* in the response message, if included, to the same value as included in the received RRC message that triggered the response message;
- 1> upon receiving a choice value set to *setup*:
 - 2> apply the corresponding received configuration and start using the associated resources, unless explicitly specified otherwise;
- 1> upon receiving a choice value set to *release*:

2> clear the corresponding configuration and stop using the associated resources;

NOTE 1a: Following receipt of choice value set to release, the UE considers the field as if it was never configured.

- 1> upon handover to E-UTRA; or
- 1> upon receiving an RRCConnectionReconfiguration message including the fullConfig:
 - 2> apply the Conditions in the ASN.1 for inclusion of the fields for the DRB/PDCP/RLC setup during the reconfiguration of the DRBs included in the *drb-ToAddModList*;
- NOTE 2: At each point in time, the UE keeps a single value for each field except for during handover when the UE temporarily stores the previous configuration so it can revert back upon handover failure. In other words: when the UE reconfigures a field, the existing value is released except for during handover.
- NOTE 3: Although not explicitly stated, the UE initially considers all functionality to be deactivated/ released until it is explicitly stated that the functionality is setup/ activated. Correspondingly, the UE initially considers lists to be empty e.g. the list of radio bearers, the list of measurements.
- 1> upon receiving an extension field comprising the entries in addition to the ones carried by the original field (regardless of whether E-UTRAN may signal more entries in total); apply the following generic behaviour if explicitly stated to be applicable:
 - 2> create a combined list by concatenating the additional entries included in the extension field to the original field while maintaining the order among both the original and the additional entries;
 - 2> for the combined list, created according to the previous, apply the same behaviour as defined for the original field;
- NOTE 4: A field comprising a list of entries normally includes 'list' in the field name. The typical way to extend (the size of) such a list is to introduce a field comprising the additional entries, which should include 'listExt' in the name of the field/ IE. E.g. *field1List-RAT*, *field1ListExt-RAT*.
- 1> consider the term DC to cover the case of an E-UTRA MCG and SCG; Likewise, MCG covers the case of an E-UTRA MCG, SCG covers the case of an E-UTRA SCG, serving cell covers the case of an E-UTRA serving cell, PDCP covers the case of PDCP defined by E-UTRA specifications;

NOTE 5: In this specification, UE configuration refers to the parameters configured by E-UTRA RRC unless stated otherwise. Likewise, when a procedure is mentioned, this concerns the procedure defined by E-UTRA RRC unless stated otherwise.

5.1.3 Requirements for UE in MR-DC

In this specification, the UE considers itself to be configured with;

- EN-DC if and only if it is configured with *nr-SecondaryCellGroupConfig* and it is connected to EPC,
- NGEN-DC if and only if it is configured with *nr-SecondaryCellGroupConfig* and it is connected to 5GC,
- NE-DC if and only if it is configured with *mrdc-SecondaryCellGroup* set to *eutra-SCG* according to TS 38.331[82],
- MR-DC if and only if it is configured with (NG)EN-DC or NE-DC.
- NOTE 1: The above deviates from the definition in TS 37.340 [81] (and some other specifications) i.e. according to TS 37.340 [81] a UE that is not configured with an SCG is in MR-DC when one or more bearers are terminated in the secondary node (i.e. using NR PDCP).

NOTE 2: MR-DC includes NR-DC, but that option is not relevant for this specification.

The UE configured with NE-DC only executes a sub-clause of clause 5 from this specification when the concerned subclause:

- is referrenced from a subclause, either in this specification or in TS 38.331 [82], that is executed by the UE; or
- covers actions upon (re-)configuration of field(s), IE(s), UE variable(s) or timer(s) applicable for NE-DC;

When executing a subclause of clause 5 in this specification, the UE also follows the related general requirements as defined in clause 5.1.2 and other subclauses of this specification e.g. message processing delay requirements.

5.2 System information

5.2.1 Introduction

5.2.1.1 General

System information is divided into the *MasterInformationBlock* (MIB) and a number of *SystemInformationBlocks* (SIBs) and *SystemInformationBlockPos* (posSIBs). The MIB includes a limited number of most essential and most frequently transmitted parameters that are needed to acquire other information from the cell, and is transmitted on BCH. SIBs other than *SystemInformationBlockType1* and posSIBs are carried in *SystemInformation* (SI) messages. The mapping of SIBs and posSIBs to SI messages is flexibly configurable by *schedulingInfoList* and *posSchedulingInfoList*, respectively, included in *SystemInformationBlockType1*, with restrictions that: each SIB is contained only in a single SI message and each SIB and posSIB is contained at most once in that SI message; *SystemInformationBlockType2* is always mapped to the SI message that corresponds to the first entry in the list of SI messages in *schedulingInfoList*. There may be multiple SI messages transmitted with the same periodicity. *SystemInformationBlockType1* and all SI messages are transmitted on DL-SCH.

The Bandwidth reduced Low Complexity (BL) UEs and UEs in Coverage Enhancement (CE) apply Bandwidth Reduced (BR) version of the SIB, posSIB or SI messages. A UE considers itself in enhanced coverage as specified in TS 36.304 [4]. In this and subsequent clauses, anything applicable for a particular SIB, posSIB or SI message equally applies to the corresponding BR version unless explicitly stated otherwise.

For NB-IoT, a reduced set of system information block with similar functionality but different content is defined; the UE applies the NB-IoT (NB) version of the MIB and the SIBs. These are denoted *MasterInformationBlock-NB*, *MasterInformationBlock-TDD-NB and SystemInformationBlockTypeX-NB* in this specification. All other system information blocks (without NB suffix) are not applicable to NB-IoT; this is not further stated in the corresponding text.

NOTE 1: The physical layer imposes a limit to the maximum size a SIB can take. When DCI format 1C is used the maximum allowed by the physical layer is 1736 bits (217 bytes) while for format 1A the limit is 2216 bits (277 bytes), see TS 36.212 [22] and TS 36.213 [23]. For BL UEs and UEs in CE, the maximum SIB and SI message size is 936 bits, see TS 36.213 [23]. For NB-IoT, the maximum SIB and SI message size is 680 bits, see TS 36.213 [23].

In addition to broadcasting, E-UTRAN may provide *SystemInformationBlockType1* and/or *SystemInformationBlockType2*, including the same parameter values, via dedicated signalling i.e., within an *RRCConnectionReconfiguration* message.

The UE applies the system information acquisition and change monitoring procedures for the PCell, except when being a BL UE or a UE in CE or a NB-IoT UE in RRC_CONNECTED mode while T311 is not running. For an SCell, E-UTRAN provides, via dedicated signalling, all system information relevant for operation in RRC_CONNECTED when adding the SCell. However, a UE that is configured with DC shall aquire the *MasterInformationBlock* of the PSCell but use it only to determine the SFN timing of the SCG, which may be different from the MCG. Upon change of the relevant system information of a configured SCell, E-UTRAN releases and subsequently adds the concerned SCell, which may be done with a single *RRCConnectionReconfiguration* message. If the UE is receiving or interested to receive an MBMS service in a cell, the UE shall apply the system information acquisition and change monitoring procedure to acquire parameters relevant for MBMS operation and apply the parameters acquired from system information only for MBMS operation for this cell.

NOTE 2: E-UTRAN may configure via dedicated signalling different parameter values than the ones broadcast in the concerned SCell.

In MBMS-dedicated cell, non-MBSFN subframes are used for providing *MasterInformationBlock-MBMS* (MIB-MBMS) and *SystemInformationBlockType1-MBMS*. SIBs other than *SystemInformationBlockType1-MBMS* are carried in *SystemInformation-MBMS* message which is also provided on non-MBSFN subframes.

An RN configured with an RN subframe configuration does not need to apply the system information acquisition and change monitoring procedures. Upon change of any system information relevant to an RN, E-UTRAN provides the system information blocks containing the relevant system information to an RN configured with an RN subframe configuration via dedicated signalling using the *RNReconfiguration* message. For RNs configured with an RN subframe configuration, the system information contained in this dedicated signalling replaces any corresponding stored system information acquired through the system information acquired through the system information acquisition procedure. The dedicated system information remains valid until overridden.

NOTE 3: E-UTRAN may configure an RN, via dedicated signalling, with different parameter values than the ones broadcast in the concerned cell.

5.2.1.2 Scheduling

The MIB uses a fixed schedule with a periodicity of 40 ms and repetitions made within 40 ms. The first transmission of the MIB is scheduled in subframe #0 of radio frames for which the SFN mod 4 = 0, and repetitions are scheduled in subframe #0 of all other radio frames. For TDD/FDD system with a bandwidth larger than 1.4 MHz that supports BL UEs or UEs in CE, MIB transmission may additionally be repeated in subframe#0 of the same radio frame, and in subframe#9 of the previous radio frame for FDD and subframe #5 of the same radio frame for TDD.

NOTE: The UE may assume the scheduling of MIB repetitions does not change. E-UTRAN may indicate in *MobilityControlInfo* whether optional MIB repetitions are enabled or not.

The MIB-MBMS uses a fixed schedule with a periodicity of 160 ms and repetitions made within 160 ms. The first transmission of the MIB-MBMS is scheduled in subframe #0 of radio frames for which the SFN mod 16 = 0, and repetitions are scheduled in subframe #0 of all other radio frames for which the SFN mod 4 = 0.

The *SystemInformationBlockType1* uses a fixed schedule with a periodicity of 80 ms and repetitions made within 80 ms. The first transmission of *SystemInformationBlockType1* is scheduled in subframe #5 of radio frames for which the SFN mod 8 = 0, and repetitions are scheduled in subframe #5 of all other radio frames for which SFN mod 2 = 0.

For BL UEs or UEs in CE, MIB is applied which may be provided with additional repetitions, while for SIB1 and further SI messages, separate messages are used which are scheduled independently and with content that may differ. The separate instance of SIB1 is named as *SystemInformationBlockType1-BR*. The *SystemInformationBlockType1-BR* uses a schedule with a periodicity of 80ms. TBS for *SystemInformationBlockType1-BR* and the repetitions made within 80ms are indicated via *schedulingInfoSIB1-BR* in MIB or optionally in the *RRCConnectionReconfiguration* message including the *MobilityControlInfo*.

The *SystemInformationBlockType1-MBMS* uses fixed schedule with a periodicity of 160 ms. The first transmission of *SystemInformationBlockType1-MBMS* is scheduled in subframe #0 of radio frames for which the SFN mod 16 = 0, and repetitions are scheduled in subframe #0 of all other radio frames for which SFN mod 8 = 0. Additionally, the *SystemInformationBlockType1-MBMS* and other system informations blocks may be scheduled in additional non-MBSFN subframes indicated in *MasterInformationBlock-MBMS*.

The SI messages are transmitted within periodically occurring time domain windows (referred to as SI-windows) using dynamic scheduling. Each SI message is associated with a SI-window and the SI-windows of different SI messages do not overlap. That is, within one SI-window only the corresponding SI is transmitted. The length of the SI-window is common for all SI messages, and is configurable. Within the SI-window, the corresponding SI message can be transmitted a number of times in any subframe other than MBSFN subframes, uplink subframes in TDD, and subframe #5 of radio frames for which SFN mod 2 = 0. The UE acquires the detailed time-domain scheduling (and other information, e.g. frequency-domain scheduling, used transport format) from decoding SI-RNTI on PDCCH (see TS 36.321 [6]). For a BL UE or a UE in CE, the detailed time/frequency domain scheduling information for the SI messages is provided in *SystemInformationBlockType1-BR*.

For UEs other than BL UE or UEs in CE SI-RNTI is used to address *SystemInformationBlockType1* as well as all SI messages. On MBMS-dedicated cell and on FeMBMS/Unicast-mixed cell, SI-RNTI with value in accordance with TS 36.321 [6] is used to address all SI messages whereas SI-RNTI with value in accordance with TS 36.321 [6] is used to address *SystemInformationBlockType1-MBMS*.

SystemInformationBlockType1 configures the SI-window length and the transmission periodicity for the SI messages.

5.2.1.2a Scheduling for NB-IoT

The *MasterInformationBlock-NB* (MIB-NB) uses a fixed schedule with a periodicity of 640 ms and repetitions made within 640 ms. The first transmission of the MIB-NB is scheduled in subframe #0 of radio frames for which the SFN mod 64 = 0 and repetitions are scheduled in subframe #0 of all other radio frames. The transmissions are arranged in 8 independently decodable blocks of 80 ms duration.

The *MasterInformationBlock-TDD-NB* (MIB-TDD-NB) uses a fixed schedule with a periodicity of 640 ms and repetitions made within 640 ms. The first transmission of the MIB-TDD-NB is scheduled in subframe #9 of radio frames for which the SFN mod 64 = 0 and repetitions are scheduled in subframe #9 of all other radio frames. The transmissions are arranged in 8 independently decodable blocks of 80 ms duration.

The SystemInformationBlockType1-NB (SIB1-NB) uses a fixed schedule with a periodicity of 2560 ms.

For FDD, SIB1-NB transmission occurs in subframe #4 of every other frame in 16 continuous frames. The starting frame for the first transmission of the SIB1-NB is derived from the cell PCID and the number of repetitions within the 2560 ms period and repetitions are made, equally spaced, within the 2560 ms period (see TS 36.213 [23]). TBS for *SystemInformationBlockType1-NB* and the repetitions made within the 2560 ms are indicated by *schedulingInfoSIB1* field in the MIB-NB. If *additionalTransmissionSIB1* is set to TRUE in the MIB-NB, additional SIB1-NB transmission occurs in subframe #3 of the same radio frames where SIB1-NB transmission occurs with the same number of repetitions.

For TDD, SIB1-NB transmission on the anchor carrier occurs in either subframe #0 or subframe #4 of every other frame in 16 continuous frames and SIB1-NB transmission on a non-anchor carrier occurs in subframe #0 and next in subframe #5 of every other frame in 16 continuous frames. The starting frame for the first transmission of the SIB1-NB is derived from the cell PCID and the number of repetitions within the 2560 ms period and repetitions are made, equally spaced, within the 2560 ms period (see TS 36.213 [23]). TBS for *SystemInformationBlockType1-NB*, the repetitions made within the 2560 ms, and the subframe index (#0 or #4) are indicated by *schedulingInfoSIB1* field in the MIB-TDD-NB.

The SI messages are transmitted within periodically occurring time domain windows (referred to as SI-windows) using scheduling information provided in *SystemInformationBlockType1-NB*. Each SI message is associated with a SI-window and the SI-windows of different SI messages do not overlap. That is, within one SI-window only the corresponding SI is transmitted. The length of the SI-window is common for all SI messages, and is configurable.

Within the SI-window, the corresponding SI message can be transmitted a number of times over 2 or 8 consecutive NB-IoT downlink subframes depending on TBS. The UE acquires the detailed time/frequency domain scheduling information and other information, e.g. used transport format for the SI messages from *schedulingInfoList* field in *SystemInformationBlockType1-NB*. The UE is not required to accumulate several SI messages in parallel but may need to accumulate a SI message across multiple SI windows, depending on coverage condition. *SystemInformationBlockType1-NB* configures the SI-window length and the transmission periodicity for all SI messages.

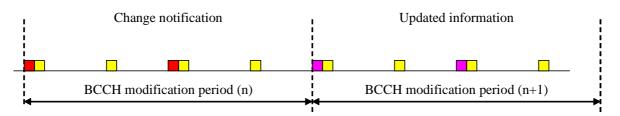
5.2.1.3 System information validity and notification of changes

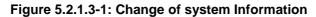
Change of system information (other than for ETWS, CMAS and EAB parameters and other than for AB parameters for NB-IoT) only occurs at specific radio frames, i.e. the concept of a modification period is used. System information may be transmitted a number of times with the same content within a modification period, as defined by its scheduling. The modification period boundaries are defined by SFN values for which SFN mod m=0, where m is the number of radio frames comprising the modification period. The modification period is configured by system information. If H-SFN is provided in *SystemInformationBlockType1-BR*, modification period boundaries for BL UEs and UEs in CE are defined by SFN values for which (H-SFN * 1024 + SFN) mod m=0. For NB-IoT, H-SFN is always provided and the modification period boundaries are defined by SFN values for which (H-SFN * 1024 + SFN) mod m=0.

To enable system information update notification for RRC_IDLE UEs configured to use a DRX cycle longer than the modification period, an eDRX acquisition period is defined. The boundaries of the eDRX acquisition period are determined by H-SFN values for which H-SFN mod 256 =0. For NB-IoT, the boundaries of the eDRX acquisition period are determined by H-SFN values for which H-SFN mod 1024 =0.

NOTE 1: If the UE in RRC_IDLE is configured to use extended DRX cycle, e.g., in the order of several minutes or longer, in case the eNB is reset the UE SFN may not be synchronized to the new eNB SFN. The UE is expected to recover, e.g., acquire MIB within a reasonable time, to avoid repeated paging failures.

When the network changes (some of the) system information, it first notifies the UEs about this change, i.e. this may be done throughout a modification period. In the next modification period, the network transmits the updated system information. These general principles are illustrated in figure 5.2.1.3-1, in which different colours indicate different system information. Upon receiving a change notification, the UE not configured to use a DRX cycle that is longer than the modification period acquires the new system information immediately from the start of the next modification period. Upon receiving a change notification applicable to eDRX, a UE in RRC_IDLE configured to use a DRX cycle that is longer than the modification period acquires the updated system information immediately from the start of the next eDRX acquisition period. The UE applies the previously acquired system information until the UE acquires the new system information. The possible boundaries of modification for *SystemInformationBlockType1-BR* are defined by SFN values for which SFN mod 512 = 0 except for notification of ETWS/CMAS for which the eNB may change *SystemInformationBlockType1-BR* content at any time. For NB-IoT, the possible boundaries of modification for *SystemInformationBlockType1-NB* are defined by SFN values for which (H-SFN * 1024 + SFN) mod 4096 = 0.





The *Paging* message is used to inform UEs in RRC_IDLE and UEs in RRC_CONNECTED about a system information change. If the UE is in RRC_CONNECTED or is not configured to use a DRX cycle longer than the modification period in RRC_IDLE, and receives a *Paging* message including the *systemInfoModification*, it knows that the system information will change at the next modification period boundary. A UE in RRC_IDLE that is configured to use a DRX cycle longer than the modification period, and receives in an eDRX acquisition period at least one *Paging* message including the *systemInfoModification-eDRX*, shall acquire the updated system information at the next eDRX acquisition period boundary. Although the UE may be informed about changes in system information, no further details are provided e.g. regarding which system information will change, except if *systemInfoValueTagSI* is received by BL UEs or UEs in CE.

In RRC_CONNECTED, BL UEs or UEs in CE or NB-IoT UEs are not required to acquire system information except when T311 is running or upon handover where the UE is only required to acquire the *MasterInformationBlock* in the target PCell. In RRC_IDLE, E-UTRAN may notify BL UEs or UEs in CE or NB-IoT UEs about SI update, and except for NB-IoT, ETWS and CMAS notification and EAB modification, using Direct Indication information, as specified in 6.6 (or 6.7.5 in NB-IoT) and TS 36.212 [22].

NOTE 2: Upon system information change essential for BL UEs, UEs in CE, or NB-IoT UEs in RRC_CONNECTED, E-UTRAN may initiate connection release.

SystemInformationBlockType1 (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) includes a value tag *systemInfoValueTag*, that indicates if a change has occurred in the SI messages. UEs may use *systemInfoValueTag*, e.g. upon return from out of coverage, to verify if the previously stored SI messages are still valid. *MasterInformationBlock* (using *systemInfoUnchanged-BR*) and RSS (if transmitted) may indicate that a change has not occurred in the SIB1-BR and SI messages of the current cell at least over the SI validity time, and the BL UEs or UEs in CE may use *systemInfoUnchanged-BR* or RSS, e.g. upon return from out of coverage, to verify if the previously stored SIB1-BR and SI messages are still valid. Additionally, for other than BL UEs or UEs in CE or NB-IoT UEs, the UE considers stored system information to be invalid after 3 hours from the moment it was successfully confirmed as valid, unless specified otherwise. BL UE or UE in CE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid, unless the UE is configured by parameter *si-ValidityTime* to consider stored system information to be invalid 3 hours after validity confirmation. NB-IoT UE considers stored system information to be invalid after 24 hours from the moment it was successfully confirmed as valid. If a BL UE, UE in CE or NB-IoT UE in RRC_CONNECTED state considers the stored system information invalid, the UE shall continue using the stored system information while in RRC_CONNECTED state in the serving cell.

For BL UEs or UEs in CE or NB-IoT UEs, the change of specific SI message can additionally be indicated by a SI message specific value tag *systemInfoValueTagSI*. If *systemInfoValueTag* included in the *SystemInformationBlockType1-BR* (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) is different from the one of the stored system information and if *systemInfoValueTagSI* is included in the *SystemInformationBlockType1-BR* (or *SystemInformationBlockType1-NB* in NB-IoT) for a specific SI message and is different from the stored one, the UE shall consider this specific SI message to be invalid. If only *systemInfoValueTag* is included and is different from the stored one, the BL UE or UE in CE should consider any stored system information except *SystemInformationBlockType10*, *SystemInformationBlockType11*, *SystemInformationBlockType12* and *SystemInformationBlockType14* to be invalid; the NB-IoT UE should consider any stored system information except *SystemInformationBlockType14-NB* to be invalid.

On MBMS-dedicated cell and on FeMBMS/Unicast-mixed cell, the change of system information and ETWS/CMAS notification is indicated by using Direct Indication FeMBMS defined in 6.6a. The modification periodicity follows MCCH modification periodicity as defined in 5.8.1.3.

E-UTRAN may not update *systemInfoValueTag* upon change of some system information e.g. ETWS information, CMAS information, regularly changing parameters like time information (*SystemInformationBlockType8*, *SystemInformationBlockType16*, *hyperSFN-MSB* in *SystemInformationBlockType1-NB*), EAB and AB parameters, or positioning system information blocks. Similarly, E-UTRAN may not include the *systemInfoModification* within the *Paging* message upon change of some system information.

The UE that is not configured to use a DRX cycle longer than the modification period verifies that stored system information remains valid by either checking *systemInfoValueTag* in *SystemInformationBlockType1* (or *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT) after the modification period boundary, or attempting to find the *systemInfoModification* indication at least *modificationPeriodCoeff* times during the modification period in case no paging is received, in every modification period. If no paging message is received by the UE during a modification period, the UE may assume that no change of system information will occur at the next modification period boundary. If UE in RRC_CONNECTED, during a modification period, receives one paging message, it may deduce from the presence/ absence of *systemInfoModification* whether a change of system information other than ETWS information, CMAS information and EAB parameters will occur in the next modification period or not.

When the RRC_IDLE UE is configured with a DRX cycle that is longer than the modification period, and at least one modification period boundary has passed since the UE last verified validity of stored system information, the UE verifies that stored system information remains valid by checking the *systemInfoValueTag* before establishing or resuming an RRC connection.

ETWS and/or CMAS capable UEs in RRC_CONNECTED, other than BL UEs and UEs in CE, shall attempt to read paging at least once every *defaultPagingCycle* to check whether ETWS and/or CMAS notification is present or not.

5.2.1.4 Indication of ETWS notification

ETWS primary notification and/ or ETWS secondary notification can occur at any point in time. The *Paging* message is used to inform ETWS capable UEs in RRC_IDLE and UEs in RRC_CONNECTED about presence of an ETWS primary notification and/ or ETWS secondary notification. If the UE receives a *Paging* message including the *etws-Indication*, it shall start receiving the ETWS primary notification and/ or ETWS secondary notification and/ or ETWS primary notification and/ or ETWS primary notification and/ or ETWS primary notification and/ or ETWS secondary notification and/ or ETWS secondary notification and/ or ETWS secondary notification and/ or ETWS primary notification and/ or ETWS secondary notification according to

schedulingInfoList contained in *SystemInformationBlockType1*. If the UE receives *Paging* message including the *etws-Indication* while it is acquiring ETWS notification(s), the UE shall continue acquiring ETWS notification(s) based on the previously acquired *schedulingInfoList* until it re-acquires *schedulingInfoList* in *SystemInformationBlockType1*.

NOTE: The UE is not required to periodically check *schedulingInfoList* contained in *SystemInformationBlockType1*, but *Paging* message including the *etws-Indication* triggers the UE to reacquire *schedulingInfoList* contained in *SystemInformationBlockType1* for scheduling changes for *SystemInformationBlockType10* and *SystemInformationBlockType11*. The UE may or may not receive a *Paging* message including the *etws-Indication* and/or *systemInfoModification* when ETWS is no longer scheduled.

ETWS primary notification is contained in *SystemInformationBlockType10* and ETWS secondary notification is contained in *SystemInformationBlockType11*. Segmentation can be applied for the delivery of a secondary notification. The segmentation is fixed for transmission of a given secondary notification within a cell (i.e. the same segment size for a given segment with the same *messageIdentifier*, *serialNumber* and *warningMessageSegmentNumber*). An ETWS secondary notification corresponds to a single *CB data* IE as defined according to TS 23.041 [37].

5.2.1.5 Indication of CMAS notification

CMAS notification can occur at any point in time. The *Paging* message is used to inform CMAS capable UEs in RRC_IDLE and UEs in RRC_CONNECTED about presence of one or more CMAS notifications. If the UE receives a *Paging* message including the *cmas-Indication*, it shall start receiving the CMAS notifications according to *schedulingInfoList* contained in *SystemInformationBlockType1*. If the UE receives *Paging* message including the *cmas-Indication*, it shall start receiving the UE receives *Paging* message including the *cmas-Indication* while it is acquiring CMAS notification(s), the UE shall continue acquiring CMAS notification(s) based on the previously acquired *schedulingInfoList* until it re-acquires *schedulingInfoList* in *SystemInformationBlockType1*.

NOTE: The UE is not required to periodically check *schedulingInfoList* contained in *SystemInformationBlockType1*, but *Paging* message including the *cmas-Indication* triggers the UE to reacquire *schedulingInfoList* contained in *SystemInformationBlockType1* for scheduling changes for *SystemInformationBlockType12*. The UE may or may not receive a *Paging* message including the *cmas-Indication* and/or *systemInfoModification* when *SystemInformationBlockType12* is no longer scheduled.

CMAS notification is contained in *SystemInformationBlockType12*. A CMAS notification corresponds to a single *CB data* IE as defined according to TS 23.041 [37]. A CMAS notification may optionally have associated warning area coordinates. Segmentation can be applied for the delivery of a CMAS notification and, if present, the associated warning area coordinates. The segmentation is fixed for transmission of a given CMAS notification and, if present, any associated warning area coordinates within a cell (i.e. the same segment size for a given segment with the same *messageIdentifier, serialNumber* and *warningMessageSegmentNumber*). E-UTRAN does not interleave transmissions of CMAS notifications, i.e. all segments of a given CMAS notification transmission are transmitted prior to those of another CMAS notification.

5.2.1.6 Notification of EAB parameters change

Change of EAB parameters can occur at any point in time. The EAB parameters are contained in *SystemInformationBlockType14*. The *Paging* message is used to inform EAB capable UEs in RRC_IDLE about a change of EAB parameters or that *SystemInformationBlockType14* is no longer scheduled. If the UE receives a *Paging* message including the *eab-ParamModification*, it shall acquire *SystemInformationBlockType14* according to *schedulingInfoList* contained in *SystemInformationBlockType1*. If the UE receives a *Paging* message including the *eab-ParamModification*, it shall acquire *SystemInformationBlockType14* according to *schedulingInfoList* contained in *SystemInformationBlockType1*. If the UE receives a *Paging* message including the *eab-ParamModification* while it is acquiring *SystemInformationBlockType14*, the UE shall continue acquiring *SystemInformationBlockType14* based on the previously acquired *schedulingInfoList* until it re-acquires *schedulingInfoList* in *SystemInformationBlockType1*.

NOTE: The EAB capable UE is not expected to periodically check *schedulingInfoList* contained in *SystemInformationBlockType1*.

5.2.1.7 Access Barring parameters change in NB-IoT

Change of Access Barring (AB) parameters can occur at any point in time. The AB parameters are contained in *SystemInformationBlockType14-NB*. Update of the AB parameters does not impact the *systemInfoValueTag* in the *MasterInformationBlock-NB/MasterInformationBlock-TDD-NB* or the *systemInfoValueTagSI* in *SystemInformationBlockType1-NB*.

If *SystemInformationBlockType14-NB* is scheduled, a NB-IoT UE is required to acquire *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* before initiating RRC connection establishment / resume for all access causes except mobile terminating calls to check *ab-Enabled* indication. If access barring is enabled the UE shall not initiate the RRC connection establishment / resume for all access causes except mobile terminating calls until the UE has acquired the *SystemInformationBlockType14-NB*.

5.2.2 System information acquisition

5.2.2.1 General

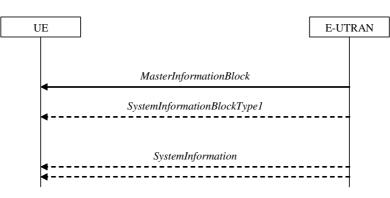


Figure 5.2.2.1-1: System information acquisition, normal

The UE applies the system information acquisition procedure to acquire the AS- and NAS- and positioning-system information that is broadcasted by the E-UTRAN. The procedure applies to UEs in RRC_IDLE and UEs in RRC_CONNECTED.

For BL UE, UE in CE and NB-IoT UE, specific conditions apply, as specified below.

5.2.2.2 Initiation

The UE shall apply the system information acquisition procedure upon selecting (e.g. upon power on) and upon reselecting a cell, after handover completion, after entering E-UTRA from another RAT, upon return from out of coverage, upon receiving a notification that the system information has changed, upon receiving an indication about the presence of an ETWS notification, upon receiving an indication about the presence of a CMAS notification, upon receiving a notification that the EAB parameters have changed, upon receiving a request from CDMA2000 upper layers, upon receiving a request from positioning upper layers and upon exceeding the maximum validity duration. Unless explicitly stated otherwise in the procedural specification, the system information acquisition procedure overwrites any stored system information, i.e. delta configuration is not applicable for system information and the UE discontinues using a field if it is absent in system information unless explicitly specified otherwise.

In RRC_CONNECTED, BL UEs and UEs in CE are required to acquire system information when T311 is running or upon handover where the UE is only required to acquire the *MasterInformationBlock* in the target PCell.

NOTE: Upon handover, E-UTRAN provides system information required by the UE in RRC_CONNECTED except MIB with RRC signalling, i.e. *systemInformationBlockType1Dedicated* and *mobilityControlInfo*.

5.2.2.3 System information required by the UE

The UE shall:

- 1> ensure having a valid version, as defined below, of (at least) the following system information, also referred to as the 'required' system information:
 - 2> if in RRC_IDLE:
 - 3> if the UE is a NB-IoT UE:

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4> the MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB and SystemInformationBlockType1-NB as well as SystemInformationBlockType2-NB through SystemInformationBlockType5-NB, SystemInformationBlockType22-NB;

3> else:

- 4> the MasterInformationBlock and SystemInformationBlockType1 (or SystemInformationBlockType1-BR depending on whether the UE is a BL UE or the UE in CE) as well as SystemInformationBlockType2 through SystemInformationBlockType8 and SystemInformationBlockType24 (depending on support of the concerned RATs), SystemInformationBlockType17 (depending on support of RAN-assisted WLAN interworking when the UE is connected to EPC), SystemInformationBlockType25 (depending on support of E-UTRA/5GC);
- 2> if in RRC_INACTIVE:
 - 3> the MasterInformationBlock and SystemInformationBlockType1 as well as SystemInformationBlockType2 through SystemInformationBlockType8 (depending on support of the concerned RATs), SystemInformationBlockType25;
- 2> if in RRC_CONNECTED; and
- 2> the UE is not a BL UE; and
- 2> the UE is not in CE; and
- 2> the UE is not a NB-IoT UE:
 - 3> the MasterInformationBlock, SystemInformationBlockType1 and SystemInformationBlockType2 as well as SystemInformationBlockType8 (depending on support of CDMA2000), SystemInformationBlockType17 (depending on support of RAN-assisted WLAN interworking when the UE is connected to EPC), SystemInformationBlockType25 (depending on support of E-UTRA/5GC);
- 2> if in RRC_CONNECTED and T311 is running; and
- 2> the UE is a BL UE or the UE is in CE or the UE is a NB-IoT UE;
 - 3> the MasterInformationBlock (or MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB in NB-IoT), SystemInformationBlockType1-BR (or SystemInformationBlockType1-NB in NB-IoT) and SystemInformationBlockType2 (or SystemInformationBlockType2-NB in NB-IoT), and for NB-IoT SystemInformationBlockType22-NB;
- 1> delete any stored system information after 3 hours or 24 hours from the moment it was confirmed to be valid as defined in 5.2.1.3, unless specified otherwise;
- 1> consider any stored system information except SystemInformationBlockType10, SystemInformationBlockType11, systemInformationBlockType12 and systemInformationBlockType14 (systemInformationBlockType14-NB in NB-IoT) to be invalid if systemInfoValueTag included in the SystemInformationBlockType1 (MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB in NB-IoT) is different from the one of the stored system information and in case of NB-IoT UEs, BL UEs and UEs in CE, systemInfoValueTagSI is not broadcasted. Otherwise consider system information validity as defined in 5.2.1.3;

5.2.2.4 System information acquisition by the UE

The UE shall:

- 1> apply the specified BCCH configuration defined in 9.1.1.1 or BR-BCCH configuration defined in 9.1.1.8;
- 1> if the procedure is triggered by a system information change notification:
 - 2> if the UE uses an idle DRX cycle longer than the modification period:
 - 3> start acquiring the required system information, as defined in 5.2.2.3, from the next eDRX acquisition period boundary;

2> else

- 3> start acquiring the required system information, as defined in 5.2.2.3, from the beginning of the modification period following the one in which the change notification was received;
- NOTE 1: The UE continues using the previously received system information until the new system information has been acquired.
- 1> if the UE is in RRC_IDLE and enters a cell for which the UE does not have stored a valid version of the system information required in RRC_IDLE, as defined in 5.2.2.3:
 - 2> acquire, using the system information acquisition procedure as defined in 5.2.3, the system information required in RRC_IDLE, as defined in 5.2.2.3;
- 1> following successful handover completion to a PCell for which the UE does not have stored a valid version of the system information required in RRC_CONNECTED, as defined in 5.2.2.3:
 - 2> acquire, using the system information acquisition procedure as defined in 5.2.3, the system information required in RRC_CONNECTED, as defined in 5.2.2.3;
 - 2> upon acquiring the concerned system information:
 - 3> discard the corresponding radio resource configuration information included in the radioResourceConfigCommon previously received in a dedicated message, if any;
- 1> following a request from CDMA2000 upper layers:

2> acquire SystemInformationBlockType8, as defined in 5.2.3;

- 1> neither initiate the RRC connection establishment/resume procedure nor initiate transmission of the RRCConnectionReestablishmentRequest message until the UE has a valid version of the MasterInformationBlock (MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB in NB-IoT) and SystemInformationBlockType1 (SystemInformationBlockType1-NB in NB-IoT) messages as well as SystemInformationBlockType2 (SystemInformationBlockType2-NB in NB-IoT), and for NB-IoT, SystemInformationBlockType22-NB;
- 1> not initiate the RRC connection establishment/resume procedure subject to EAB until the UE has a valid version of *SystemInformationBlockType14*, if broadcast;
- 1> if the UE is ETWS capable:
 - 2> upon entering a cell during RRC_IDLE, following successful handover or upon connection re-establishment:
 - 3> discard any previously buffered *warningMessageSegment*;
 - 3> clear, if any, the current values of messageIdentifier and serialNumber for SystemInformationBlockType11;
 - 2> when the UE acquires SystemInformationBlockType1 following ETWS indication, upon entering a cell during RRC_IDLE, following successful handover or upon connection re-establishment:
 - 3> if schedulingInfoList indicates that SystemInformationBlockType10 is present:
 - 4> if the UE is in CE:
- 5> start acquiring SystemInformationBlockType10;
 - 4> else

5> start acquiring SystemInformationBlockType10 immediately;

3> if *schedulingInfoList* indicates that *SystemInformationBlockType11* is present:

4> start acquiring SystemInformationBlockType11 immediately;

NOTE 2: UEs shall start acquiring *SystemInformationBlockType10* and *SystemInformationBlockType11* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.

1> if the UE is CMAS capable:

- 2> upon entering a cell during RRC_IDLE, following successful handover or upon connection re-establishment:
 - 3> discard any previously buffered *warningMessageSegment*;
 - 3> clear, if any, stored values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType12* associated with the discarded *warningMessageSegment*;
- 2> when the UE acquires SystemInformationBlockType1 following CMAS indication, upon entering a cell during RRC_IDLE, following successful handover and upon connection re-establishment:
 - 3> if *schedulingInfoList* indicates that *SystemInformationBlockType12* is present:
 - 4> acquire SystemInformationBlockType12;
- NOTE 3: UEs shall start acquiring *SystemInformationBlockType12* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.
- 1> if the UE is interested to receive MBMS services:
 - 2> if the UE is capable of MBMS reception as specified in 5.8:
 - 3> if *schedulingInfoList* indicates that *SystemInformationBlockType13* is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType13;
 - 3> else if *SystemInformationBlockType13* is present in *SystemInformationBlockType1-MBMS* and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType13 from SystemInformationBlockType1-MBMS;
 - 2> if the UE is capable of SC-PTM reception as specified in 5.8a:
 - 3> if *schedulingInfoList* indicates that *SystemInformationBlockType20* (*SystemInformationBlockType20-NB* in NB-IoT) is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType20 (SystemInformationBlockType20-NB in NB-IoT);
 - 2> if the UE is capable of MBMS Service Continuity:
 - 3> if *schedulingInfoList* indicates that *SystemInformationBlockType15* (*SystemInformationBlockType15-NB* in NB-IoT) is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType15 (SystemInformationBlockType15-NB in NB-IoT);
- 1> if the UE is EAB capable:
 - 2> when the UE does not have stored a valid version of *SystemInformationBlockType14* upon entering RRC_IDLE, or when the UE acquires *SystemInformationBlockType1* following EAB parameters change notification, or upon entering a cell during RRC_IDLE, or before establishing an RRC connection if using eDRX with DRX cycle longer than the modification period:
 - 3> if *schedulingInfoList* indicates that *SystemInformationBlockType14* is present:
 - 4> start acquiring *SystemInformationBlockType14* immediately;
 - 3> else:

4> discard SystemInformationBlockType14, if previously received;

- NOTE 4: EAB capable UEs start acquiring *SystemInformationBlockType14* as described above even when *systemInfoValueTag* in *SystemInformationBlockType1* has not changed.
- NOTE 5: EAB capable UEs maintain an up to date SystemInformationBlockType14 in RRC_IDLE.
- 1> if the UE is capable of sidelink communication and is configured by upper layers to receive or transmit sidelink communication:

- 2> if the cell used for sidelink communication meets the S-criteria as defined in TS 36.304 [4]; and
- 2> if *schedulingInfoList* indicates that *SystemInformationBlockType18* is present and the UE does not have stored a valid version of this system information block:

3> acquire SystemInformationBlockType18;

- 1> if the UE is capable of sidelink discovery and is configured by upper layers to receive or transmit sidelink discovery announcements on the primary frequency:
 - 2> if *schedulingInfoList* of the serving cell/ PCell indicates that *SystemInformationBlockType19* is present and the UE does not have stored a valid version of this system information block:
 - 3> acquire SystemInformationBlockType19;
- 1> if the UE is capable of sidelink discovery and, for each of the one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19* and for which the UE is configured by upper layers to receive sidelink discovery announcements on:
 - 2> if SystemInformationBlockType19 of the serving cell/ PCell does not provide the corresponding reception resources; and
 - 2> if *schedulingInfoList* of the cell on the concerned frequency indicates that *SystemInformationBlockType19* is present and the UE does not have stored a valid version of this system information block:

3> acquire SystemInformationBlockType19;

- 1> if the UE is capable of sidelink discovery and, for each of the one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19* and for which the UE is configured by upper layers to transmit sidelink discovery announcements on:
 - 2> if *SystemInformationBlockType19* of the serving cell/ PCell includes *discTxResourcesInterFreq* which is set to *acquireSI-FromCarrier*; and
 - 2> if *schedulingInfoList* of the cell on the concerned frequency indicates that *SystemInformationBlockType19* is present and the UE does not have stored a valid version of this system information block:
 - 3> acquire SystemInformationBlockType19;
- 1> if the UE is a NB-IoT UE and if *ab-Enabled* included in *MasterInformationBlock-NB/MasterInformationBlock-TDD-NB* is set to *TRUE*:
 - 2> not initiate the RRC connection establishment/resume procedure for all access causes except mobile terminating calls until the UE has acquired the *SystemInformationBlockType14-NB*;
- 1> if the UE is capable of V2X sidelink communication and is configured by upper layers to receive or transmit V2X sidelink communication on a frequency:
 - 2> if *schedulingInfoList* on the serving cell/PCell indicates that *SystemInformationBlockType21* is present and the UE does not have stored valid version of this system information block:
 - 3> acquire SystemInformationBlockType21 from serving cell/PCell;
 - 2> if *schedulingInfoList* on the serving cell/PCell indicates that *SystemInformationBlockType26* is present and the UE does not have stored valid version of this system information block;
 - 3> acquire SystemInformationBlockType26 from serving cell/PCell;
- 1> if the UE is capable of V2X sidelink communication and is configured by upper layers to receive V2X sidelink communication on a frequency, which is not primary frequency:
 - 2> if neither *SystemInformationBlockType21* nor *SystemInformationBlockType26* of the serving cell/ PCell provide reception resource pool for V2X sidelink communication for the concerned frequency; and
 - 2> if the cell used for V2X sidelink communication on the concerned frequency meets the S-criteria as defined in TS 36.304 [4]:

3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType21* is present and the UE does not have stored a valid version of this system information block:

4> acquire SystemInformationBlockType21 from the concerned frequency;

- 3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType26* is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType26 from the concerned frequency;
- 1> if the UE is capable of V2X sidelink communication and is configured by upper layers to transmit V2X sidelink communication on a frequency, which is not primary frequency and is not included in v2x-InterFreqInfoList in SystemInformationBlockType21 nor SystemInformationBlockType26 of the serving cell/PCell:
 - 2> if the cell used for V2X sidelink communication on the concerned frequency meets the S-criteria as defined in TS 36.304 [4]:
 - 3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType21* is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire SystemInformationBlockType21 from the concerned frequency;
 - 3> if *schedulingInfoList* on the concerned frequency indicates that *SystemInformationBlockType26* is present and the UE does not have stored a valid version of this system information block:
 - 4> acquire *SystemInformationBlockType26* from the concerned frequency;
- 1> if the NB-IoT UE supports NPRACH resources using preamble format 2:
 - 2> if *schedulingInfoList* indicates that *SystemInformationBlockType23-NB* is present and the UE does not have stored a valid version of this system information block:
 - 3> acquire SystemInformationBlockType23-NB;
- 1> following a request from positioning upper layers:
 - 2> acquire SystemInformationBlockPos, as defined in 5.2.3;

The UE may apply the received SIBs or posSIBs immediately, i.e. the UE does not need to delay using a SIB or posSIB until all SI messages have been received. The UE may delay applying the received SIBs until completing lower layer procedures associated with a received or a UE originated RRC message, e.g. an ongoing random access procedure.

NOTE 6: While attempting to acquire a particular SIB/posSIB, if the UE detects from *schedulingInfoList/ posSchedulingInfoList* that it is no longer present, the UE should stop trying to acquire the particular SIB/ posSIB.

5.2.2.5 Essential system information missing

The UE shall:

- 1> if in RRC_IDLE, RRC_INACTIVE or in RRC_CONNECTED while T311 is running:
 - 2> if the UE is unable to acquire the *MasterInformationBlock (MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* in NB-IoT); or
 - 2> if the UE is neither a BL UE nor in CE nor in NB-IoT and the UE is unable to acquire the SystemInformationBlockType1; or
 - 2> if the BL UE or UE in CE is unable to acquire *SystemInformationBlockType1-BR* or *SystemInformationBlockType1-BR* is not scheduled; or
 - 2> if the NB-IoT UE is unable to acquire the SystemInformationBlockType1-NB:

3> consider the cell as barred in accordance with TS 36.304 [4]; and

3> perform barring as if *intraFreqReselection* is set to *allowed*, and as if the *csg-Indication* is set to *FALSE*;

2> else:

- 3> if the UE is unable to acquire the SystemInformationBlockType2 (or SystemInformationBlockType2-NB in NB-IoT) and for NB-IoT, SystemInformationBlockType22-NB if scheduled; or
- 3> if SystemInformationBlockType25 is broadcast and if the UE is connected to 5GC and is unable to acquire the SystemInformationBlockType25:
 - 4> treat the cell as barred in accordance with TS 36.304 [4];

5.2.2.6 Actions upon reception of the *MasterInformationBlock* message

Upon receiving the MasterInformationBlock message the UE shall:

- 1> apply the radio resource configuration included in the *phich-Config*;
- 1> if the UE is in RRC_IDLE or if the UE is in RRC_CONNECTED while T311 is running:
 - 2> if the UE has no valid system information stored according to 5.2.2.3 for the concerned cell:
 - 3> apply the received value of *dl-Bandwidth* to the *ul-Bandwidth* until *SystemInformationBlockType2* is received;

Upon receiving the MasterInformationBlock-NB or MasterInformationBlock-TDD-NB message the UE shall:

1> apply the radio resource configuration included in accordance with the *operationModeInfo*.

No UE requirements related to the contents of *MasterInformationBlock-MBMS* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.7 Actions upon reception of the SystemInformationBlockType1 message

Upon receiving the *SystemInformationBlockType1* or *SystemInformationBlockType1-BR* either via broadcast or via dedicated signalling, the UE shall:

- 1> if the upper layers indicate the selected core network type as 5GC:
 - 2> if the *cellAccessRelatedInfoList-5GC* contains an entry with the *plmn-Identity* or *plmn-Index* of the selected PLMN:
 - 3> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *cellAccessRelatedInfoList-5GC* containing the selected PLMN;
- 1> else if the *cellAccessRelatedInfoList* contains an entry with the *PLMN-Identity* of the selected PLMN:
 - 2> in the remainder of the procedures use *plmn-IdentityList*, *trackingAreaCode*, and *cellIdentity* for the cell as received in the corresponding *cellAccessRelatedInfoList* containing the selected PLMN;
- 1> if in RRC_IDLE or in RRC_CONNECTED while T311 is running; and
- 1> if the UE is a category 0 UE according to TS 36.306 [5]; and
- 1> if *categoryOAllowed* is not included in *SystemInformationBlockType1*:

2> consider the cell as barred in accordance with TS 36.304 [4];

- 1> if in RRC_CONNECTED while T311 is not running, and the UE supports multi-band cells as defined by bit 31 in *featureGroupIndicators*:
 - 2> disregard the *freqBandIndicator* and *multiBandInfoList*, if received, while in RRC_CONNECTED;
 - 2> forward the *cellIdentity* to upper layers;
 - 2> forward the *trackingAreaCode* to upper layers;

1> else:

- 2> if the frequency band indicated in the *freqBandIndicator* is part of the frequency bands supported by the UE and it is not a downlink only band; or
- 2> if the UE supports *multiBandInfoList*, and if one or more of the frequency bands indicated in the *multiBandInfoList* are part of the frequency bands supported by the UE and they are not downlink only bands:
 - 3> forward the *cellIdentity* to upper layers;
 - 3> forward the *trackingAreaCode* to upper layers;
 - 3> forward the PLMN identity to upper layers;
 - 3> if in RRC_INACTIVE and the forwarded information does not trigger message transmission by upper layers:
 - 4> if the serving cell does not belong to the configured *ran-NotificationAreaInfo*:

5> initiate an RNA update as specified in 5.3.17.2;

- 3> forward the *ims-EmergencySupport* to upper layers, if present;
- 3> forward the *eCallOverIMS-Support* to upper layers, if present;
- 3> if the UE is capable of 5G NAS:
 - 4> forward the *ims-EmergencySupport5GC* to upper layers, if present;
 - 4> forward the *eCallOverIMS-Support5GC* to upper layers, if present;
- 3> if, for the frequency band selected by the UE (from *freqBandIndicator* or *multiBandInfoList*), the *freqBandInfo* or the *multiBandInfoList-v10j0* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within the *freqBandInfo* or *multiBandInfoList-v10j0*:
 - 4> apply the first listed additionalSpectrumEmission which it supports among the values included in NS-PmaxList within freqBandInfo or multiBandInfolist-v10j0;
 - 4> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS-PmaxList*:
 - 5> apply the *additionalPmax*;

4> else:

5> apply the *p*-*Max*;

3> else:

4> apply the *additionalSpectrumEmission* in *SystemInformationBlockType2* and the *p-Max*;

2> else:

3> consider the cell as barred in accordance with TS 36.304 [4]; and

3> perform barring as if *intraFreqReselection* is set to *notAllowed*, and as if the *csg-Indication* is set to *FALSE*;

Upon receiving the *SystemInformationBlockType1-NB*, the UE shall:

- 1> if the frequency band indicated in the *freqBandIndicator* is part of the frequency bands supported by the UE; or
- 1> if one or more of the frequency bands indicated in the *multiBandInfoList* are part of the frequency bands supported by the UE:

2> forward the *cellIdentity* to upper layers;

2> forward the *trackingAreaCode* to upper layers;

2> if attachWithoutPDN-Connectivity is received for the selected PLMN:

3> forward the attachWithoutPDN-Connectivity to upper layers;

2> else

3> indicate to upper layers that *attachWithoutPDN-Connectivity* is not present;

- 2> if, for the frequency band selected by the UE (from *freqBandIndicator* or *multiBandInfoList*), the *freqBandInfo* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within the *freqBandInfo*:
 - 3> apply the first listed additionalSpectrumEmission which it supports among the values included in NS-PmaxList within freqBandInfo;
 - 3> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS*-*PmaxList*:
 - 4> apply the *additionalPmax*;
 - 3> else:
 - 4> apply the *p*-Max;

2> else:

3> apply the *additionalSpectrumEmission* in *SystemInformationBlockType2-NB* and the *p-Max*;

1> else:

2> consider the cell as barred in accordance with TS 36.304 [4]; and

2> perform barring as if *intraFreqReselection* is set to *notAllowed*.

No UE requirements related to the contents of *SystemInformationBlockType1-MBMS* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.8 Actions upon reception of *SystemInformation* messages

No UE requirements related to the contents of the *SystemInformation* messages apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.9 Actions upon reception of SystemInformationBlockType2

Upon receiving SystemInformationBlockType2, the UE shall:

- 1> apply the configuration included in the *radioResourceConfigCommon*;
- 1> if in RRC_INACTIVE:
- 2> apply the shortest of the *ran-PagingCycle* (if configured), the (UE specific) paging cycle (if indicated by upper layers), and the *defaultPagingCycle* included in the *radioResourceConfigCommon*;
- 1> else if upper layers indicate that a (UE specific) paging cycle is configured:
 - 2> apply the shortest of the (UE specific) paging cycle and the *defaultPagingCycle* included in the *radioResourceConfigCommon*;
- 1> if the *mbsfn-SubframeConfigList* is included:
 - 2> consider that DL assignments may occur in the MBSFN subframes indicated in the *mbsfn-SubframeConfigList* under the conditions specified in TS 36.213 [23], clause 7.1;

- 1> apply the specified PCCH configuration defined in 9.1.1.3;
- 1> not apply the *timeAlignmentTimerCommon*;
- 1> if in RRC_CONNECTED and UE is configured with RLF timers and constants values received within *rlf-TimersAndConstants*:
 - 2> not update its values of the timers and constants in *ue-TimersAndConstants* except for the value of timer T300;
- 1> if in RRC_CONNECTED while T311 is not running; and the UE supports multi-band cells as defined by bit 31 in *featureGroupIndicators* or *multipleNS-Pmax*:

2> disregard the *additionalSpectrumEmission* and *ul-CarrierFreq*, if received, while in RRC_CONNECTED;

- 1> if attachWithoutPDN-Connectivity is received for the selected PLMN:
 - 2> forward attachWithoutPDN-Connectivity to upper layers;

1> else:

- 2> indicate to upper layers that *attachWithoutPDN-Connectivity* is not present;
- 1> if *cp-CIoT-EPS-Optimisation is* received for the selected PLMN:
 - 2> forward *cp-CIoT-EPS-Optimisation* to upper layers;

1> else:

- 2> indicate to upper layers that *cp-CIoT-EPS-Optimisation* is not present;
- 1> if *up-CIoT-EPS-Optimisation is* received for the selected PLMN:

2> forward *up-CIoT-EPS-Optimisation* to upper layers;

1> else:

- 2> indicate to upper layers that *up-CIoT-EPS-Optimisation* is not present;
- 1> to upper layers either forward upperLayerIndication, if present for the selected PLMN, or otherwise indicate absence of this field;
- NOTE: *upperLayerIndication* is an indication to upper layers that the UE has entered a coverage area that offers 5G capabilities.

Upon receiving SystemInformationBlockType2-NB, the UE shall:

- 1> apply the configuration included in the *radioResourceConfigCommon*;
- 1> apply the *defaultPagingCycle* included in the *radioResourceConfigCommon*;
- 1> if *SystemInformationBlockType22-NB* is scheduled:

2> read and act on information sent in *SystemInformationBlockType22-NB*;

- 1> apply the specified PCCH configuration defined in 9.1.1.3.
- 1> if in RRC_CONNECTED and UE is configured with RLF timers and constants values received within *rlf-TimersAndConstants*:
 - 2> not update its values of the timers and constants in *ue-TimersAndConstants* except for the value of timer T300;

5.2.2.10 Actions upon reception of SystemInformationBlockType3

Upon receiving SystemInformationBlockType3, the UE shall:

1> if in RRC_IDLE, the *redistributionServingInfo* is included and the UE is redistribution capable:

2> perform E-UTRAN inter-frequency redistribution procedure as specified in TS 36.304 [4], clause 5.2.4.10;

1> if in RRC_IDLE, or in RRC_CONNECTED while T311 is running:

- 2> if, for the frequency band selected by the UE (from the procedure in clause 5.2.2.7) to represent the serving cell's carrier frequency, the *freqBandInfo* or the *multiBandInfoList-v10j0* is present in *SystemInformationBlockType3* and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the NS-PmaxList within the *freqBandInfo* or *multiBandInfoList-v10j0*:
 - 3> apply the first listed additionalSpectrumEmission which it supports among the values included in NS-PmaxList within freqBandInfo or multiBandInfoList-v10i0;
 - 3> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS*-*PmaxList*:

4> apply the *additionalPmax*;

3> else:

4> apply the *p*-Max;

2> else:

3> apply the *p-Max*;

Upon receiving *SystemInformationBlockType3-NB*, the UE shall:

1> if in RRC_IDLE, or in RRC_CONNECTED while T311 is running:

- 2> if, for the frequency band selected by the UE (from the procedure in clause 5.2.2.7) to represent the serving cell's carrier frequency, the *freqBandInfo* or the *multiBandInfoList* is present in *SystemInformationBlockType3-NB* and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within the *freqBandInfo* or the *multiBandInfoList*:
 - 3> apply the first listed additionalSpectrumEmission which it supports among the values included in NS-PmaxList within freqBandInfo or multiBandInfoList;
 - 3> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS*-*PmaxList*:

4> apply the *additionalPmax*;

3> else:

4> apply the *p*-Max;

2> else:

3> apply the *p*-Max;

5.2.2.11 Actions upon reception of SystemInformationBlockType4

No UE requirements related to the contents of this *SystemInformationBlock (SystemInformationBlockType4* or *SystemInformationBlockType4-NB)* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.12 Actions upon reception of SystemInformationBlockType5

Upon receiving SystemInformationBlockType5, the UE shall:

1> if in RRC_IDLE, the *redistributionInterFreqInfo* is included and the UE is redistribution capable:

2> perform E-UTRAN inter-frequency redistribution procedure as specified in TS 36.304 [4], clause 5.2.4.10;

1> if in RRC_IDLE, or in RRC_CONNECTED while T311 is running:

- 2> if the frequency band selected by the UE to represent a non-serving E UTRA carrier frequency is not a downlink only band:
 - 3> if, for the selected frequency band, the *freqBandInfo* or the *multiBandInfoList-v10j0* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within *freqBandInfo* or *multiBandInfoList-v10j0*:
 - 4> apply the first listed additionalSpectrumEmission which it supports among the values included in NS-PmaxList within freqBandInfo or multiBandInfoList-v10j0;
 - 4> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS-PmaxList*:

5> apply the *additionalPmax*;

4> else:

5> apply the *p-Max*;

3> else:

4> apply the *p*-Max;

- 1> if in RRC_IDLE and UE has stored VarMeasIdleConfig_and SIB5 includes the measIdleConfigSIB and the UE is capable of IDLE mode measurements for CA:
 - 2> if T331 is running and *VarMeasIdleConfig* does not contain *measIdleCarrierListEUTRA* received from the *RRCConnectionRelease* message:

3> store or replace the measIdleCarrierListEUTRA of measIdleConfigSIB within VarMeasIdleConfig;

2> perform idle mode measurements as specified in 5.6.20;

Upon receiving *SystemInformationBlockType5-NB*, the UE shall:

1> if in RRC_IDLE, or in RRC_CONNECTED while T311 is running:

- 2> if, for the frequency band selected by the UE (from *multiBandInfoList*) to represent a non-serving NB-IoT carrier frequency, the *freqBandInfo* is present and the UE capable of *multiNS-Pmax* supports at least one *additionalSpectrumEmission* in the *NS-PmaxList* within the *freqBandInfo*:
 - 3> apply the first listed additionalSpectrumEmission which it supports among the values included in NS-PmaxList within freqBandInfo;
 - 3> if the *additionalPmax* is present in the same entry of the selected *additionalSpectrumEmission* within *NS*-*PmaxList*:

4> apply the *additionalPmax*;

3> else:

4> apply the *p*-Max;

2> else:

3> apply the *p*-*Max*;

5.2.2.13 Actions upon reception of SystemInformationBlockType6

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.14 Actions upon reception of SystemInformationBlockType7

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.15 Actions upon reception of SystemInformationBlockType8

Upon receiving SystemInformationBlockType8, the UE shall:

- 1> if sib8-PerPLMN-List is included and the UE is capable of network sharing for CDMA2000:
 - 2> apply the CDMA2000 parameters below corresponding to the RPLMN;
- 1> if the *systemTimeInfo* is included:

2> forward the systemTimeInfo to CDMA2000 upper layers;

- 1> if the UE is in RRC_IDLE and if *searchWindowSize* is included:
 - 2> forward the *searchWindowSize* to CDMA2000 upper layers;
- 1> if *parametersHRPD* is included:
 - 2> forward the *preRegistrationInfoHRPD* to CDMA2000 upper layers only if the UE has not received the *preRegistrationInfoHRPD* within an *RRCConnectionReconfiguration* message after entering this cell;
 - 2> if the *cellReselectionParametersHRPD* is included:

3> forward the *neighCellList* to the CDMA2000 upper layers;

- 1> if the *parameters1XRTT* is included:
 - 2> if the *csfb-RegistrationParam1XRTT* is included:
 - 3> forward the *csfb-RegistrationParam1XRTT* to the CDMA2000 upper layers which will use this information to determine if a CS registration/re-registration towards CDMA2000 1xRTT in the EUTRA cell is required;

2> else:

- 3> indicate to CDMA2000 upper layers that CSFB Registration to CDMA2000 1xRTT is not allowed;
- 2> if the *longCodeState1XRTT* is included:

3> forward the *longCodeState1XRTT* to CDMA2000 upper layers;

2> if the *cellReselectionParameters1XRTT* is included:

3> forward the *neighCellList* to the CDMA2000 upper layers;

2> if the *csfb-SupportForDualRxUEs* is included:

3> forward *csfb-SupportForDualRxUEs* to the CDMA2000 upper layers;

2> else:

3> forward csfb-SupportForDualRxUEs, with its value set to FALSE, to the CDMA2000 upper layers;

2> if *ac-BarringConfig1XRTT* is included:

3> forward *ac-BarringConfig1XRTT* to the CDMA2000 upper layers;

2> if the *csfb-DualRxTxSupport* is included:

3> forward *csfb-DualRxTxSupport* to the CDMA2000 upper layers;

2> else:

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3> forward *csfb-DualRxTxSupport*, with its value set to *FALSE*, to the CDMA2000 upper layers;

5.2.2.16 Actions upon reception of SystemInformationBlockType9

Upon receiving SystemInformationBlockType9, the UE shall:

1> if *hnb-Name* is included, forward the *hnb-Name* to upper layers;

5.2.2.17 Actions upon reception of SystemInformationBlockType10

Upon receiving SystemInformationBlockType10, the UE shall:

1> forward the received *warningType*, *messageIdentifier* and *serialNumber* to upper layers;

5.2.2.18 Actions upon reception of SystemInformationBlockType11

Upon receiving SystemInformationBlockType11, the UE shall:

- 1> if there is no current value for messageIdentifier and serialNumber for SystemInformationBlockType11; or
- 1> if either the received value of *messageIdentifier* or of *serialNumber* or of both are different from the current values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11*:
 - 2> use the received values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11* as the current values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11*;
 - 2> discard any previously buffered *warningMessageSegment*;
 - 2> if all segments of a warning message have been received:
 - 3> assemble the warning message from the received warningMessageSegment;
 - 3> forward the received warning message, messageIdentifier, serialNumber and dataCodingScheme to upper layers;
 - 3> stop reception of *SystemInformationBlockType11*;
 - 3> discard the current values of messageIdentifier and serialNumber for SystemInformationBlockType11;

2> else:

- 3> store the received warningMessageSegment;
- 3> continue reception of SystemInformationBlockType11;
- 1> else if all segments of a warning message have been received:
 - 2> assemble the warning message from the received warningMessageSegment;
 - 2> forward the received complete warning message, messageIdentifier, serialNumber and dataCodingScheme to upper layers;
 - 2> stop reception of *SystemInformationBlockType11*;
 - 2> discard the current values of messageIdentifier and serialNumber for SystemInformationBlockType11;

1> else:

- 2> store the received *warningMessageSegment*;
- 2> continue reception of *SystemInformationBlockType11*;

The UE should discard any stored *warningMessageSegment* and the current value of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType11* if the complete warning message has not been assembled within a period of 3 hours.

5.2.2.19 Actions upon reception of *SystemInformationBlockType12*

Upon receiving *SystemInformationBlockType12*, the UE shall:

- 1> if the *SystemInformationBlockType12* contains a complete warning message and the complete geographical area coordinates (if any):
 - 2> forward the received warning message, *messageIdentifier*, *serialNumber*, *dataCodingScheme* and the geographical area coordinates (if any) to upper layers;
 - 2> continue reception of *SystemInformationBlockType12*;

1> else:

- 2> if the received values of *messageIdentifier* and *serialNumber* are the same (each value is the same) as a pair for which a warning message and the geographical area coordinates (if any) are currently being assembled:
 - 3> store the received *warningMessageSegment*;
 - 3> store the received *warningAreaCoordinatesSegment* (if any);
 - 3> if all segments of a warning message and geographical area coordinates (if any) have been received:
 - 4> assemble the warning message from the received *warningMessageSegment*;
 - 4> assemble the geographical area coordinates from the received warningAreaCoordinatesSegment (if any);
 - 4> forward the received warning message, messageIdentifier, serialNumber, dataCodingScheme and geographical area coordinates (if any) to upper layers;
 - 4> stop assembling a warning message and warning area coordinates (if any) for this *messageIdentifier* and *serialNumber* and delete all stored information held for it;
 - 3> continue reception of SystemInformationBlockType12;
- 2> else if the received values of *messageIdentifier* and/or *serialNumber* are not the same as any of the pairs for which a warning message is currently being assembled:
 - 3> start assembling a warning message for this *messageIdentifier* and *serialNumber* pair;
 - 3> start assembling the geographical area coordinates (if any) for this *messageIdentifier* and *serialNumber* pair;
 - 3> store the received *warningMessageSegment*;
 - 3> store the received *warningAreaCoordinatesSegment* (if any);
 - 3> continue reception of *SystemInformationBlockType12*;

The UE should discard *warningMessageSegment* and *warningAreaCoordinatesSegment* (if any) and the associated values of *messageIdentifier* and *serialNumber* for *SystemInformationBlockType12* if the complete warning message and the warning area coordinates (if any) have not been assembled within a period of 3 hours.

NOTE: The number of warning messages that a UE can re-assemble simultaneously is a function of UE implementation.

5.2.2.20 Actions upon reception of SystemInformationBlockType13

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.21 Actions upon reception of SystemInformationBlockType14

No UE requirements related to the contents of this *SystemInformationBlock* (*SystemInformationBlockType14* or *SystemInformationBlockType14-NB*) apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.22 Actions upon reception of SystemInformationBlockType15

No UE requirements related to the contents of this *SystemInformationBlock* (*SystemInformationBlockType15* or *SystemInformationBlockType15-NB*) apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.23 Actions upon reception of SystemInformationBlockType16

Upon receiving *SystemInformationBlockType16* with *timeReferenceInfo*, the UE may perform the related actions as specified in clause 5.6.1.3.

5.2.2.24 Actions upon reception of SystemInformationBlockType17

Upon receiving SystemInformationBlockType17, the UE shall:

- 1> if *wlan-OffloadConfigCommon* corresponding to the RPLMN is included:
 - 2> if the UE is not configured with *rclwi-Configuration* with *command* set to *steerToWLAN*:
 - 3> apply the *wlan-Id-List* corresponding to the RPLMN;
 - 2> if not configured with the *wlan-OffloadConfigDedicated*:
 - 3> apply the *wlan-OffloadConfigCommon* corresponding to the RPLMN;

5.2.2.25 Actions upon reception of SystemInformationBlockType18

Upon receiving SystemInformationBlockType18, the UE shall:

- 1> if *SystemInformationBlockType18* message includes the *commConfig*:
 - 2> if configured to receive sidelink communication:
 - 3> from the next SC period, as defined by *sc-Period*, use the resource pool indicated by *commRxPool* for sidelink communication monitoring, as specified in 5.10.3;
 - 2> if configured to transmit sidelink communication:
 - 3> from the next SC period, as defined by *sc-Period*, use the resource pool indicated by *commTxPoolNormalCommon*, *commTxPoolNormalCommonExt* or by *commTxPoolExceptional* for sidelink communication transmission, as specified in 5.10.4;

5.2.2.26 Actions upon reception of SystemInformationBlockType19

Upon receiving SystemInformationBlockType19, the UE shall:

- 1> if SystemInformationBlockType19 message includes the discConfig or discConfigPS:
 - 2> from the next discovery period, as defined by *discPeriod*, use the resources indicated by *discRxPool*, *discRxResourcesInterFreq* or *discRxPoolPS* for sidelink discovery monitoring, as specified in 5.10.5;
 - 2> if *SystemInformationBlockType19* message includes the *discTxPoolCommon* or *discTxPoolPS-Common*; and the UE is in RRC_IDLE:
 - 3> from the next discovery period, as defined by *discPeriod*, use the resources indicated by *discTxPoolCommon* or *discTxPoolPS-Common* for sidelink discovery announcement, as specified in 5.10.6;

- 2> if the SystemInformationBlockType19 message includes the discTxPowerInfo:
 - 3> use the power information included in *discTxPowerInfo* for sidelink discovery transmission on the serving frequency, as specified in TS 36.213 [23];
- 1> if *SystemInformationBlockType19* message includes the *discConfigRelay*:
 - 2> if the SystemInformationBlockType19 message includes the txPowerInfo:
 - 3> use the power information included in *txPowerInfo* for sidelink discovery transmission on the corresponding non-serving frequency, as specified in TS 36.213 [23];

5.2.2.27 Actions upon reception of SystemInformationBlockType20

No UE requirements related to the contents of this *SystemInformationBlock* (*SystemInformationBlockType20* or *SystemInformationBlockType20-NB*) apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.28 Actions upon reception of SystemInformationBlockType21

Upon receiving SystemInformationBlockType21, the UE shall:

- 1> if *SystemInformationBlockType21* message includes *sl-V2X-ConfigCommon*:
 - 2> if configured to receive V2X sidelink communication:
 - 3> use the resource pool indicated by v2x-CommRxPool in sl-V2X-ConfigCommon for V2X sidelink communication monitoring, as specified in 5.10.12;
 - 2> if configured to transmit V2X sidelink communication:
 - 3> use the resource pool indicated by v2x-CommTxPoolNormalCommon, p2x-CommTxPoolNormalCommon, v2x-CommTxPoolNormal, p2x-CommTxPoolNormal or by v2x-CommTxPoolExceptional for V2X sidelink communication transmission, as specified in 5.10.13;
 - 3> perform CBR measurement on the transmission resource pool(s) indicated by v2x-CommTxPoolNormalCommon, v2x-CommTxPoolNormal and v2x-CommTxPoolExceptional for V2X sidelink communication transmission, as specified in 5.5.3;

5.2.2.29 Actions upon reception of SystemInformationBlockType22-NB

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.30 Actions upon reception of SystemInformationBlockType23-NB

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.31 Actions upon reception of SystemInformationBlockType24

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.32 Actions upon reception of SystemInformationBlockType25

No UE requirements related to the contents of this *SystemInformationBlock* apply other than those specified elsewhere e.g. within procedures using the concerned system information, and/ or within the corresponding field descriptions.

5.2.2.33 Actions upon reception of SystemInformationBlockType26

Upon receiving SystemInformationBlockType26, the UE shall:

- 1> if configured to receive V2X sidelink communication:
 - 2> use the resource pool indicated by v2x-CommRxPool for V2X sidelink communication monitoring, as specified in 5.10.12;
- 1> if configured to transmit V2X sidelink communication:
 - 2> use the resource pool indicated by v2x-CommTxPoolNormal, p2x-CommTxPoolNormal or by v2x-CommTxPoolExceptional for V2X sidelink communication transmission, as specified in 5.10.13;
 - 2> perform CBR measurement on the transmission resource pool(s) indicated by v2x-CommTxPoolNormal and v2x-CommTxPoolExceptional for V2X sidelink communication transmission, as specified in 5.5.3;

5.2.2.34 Actions upon reception of SystemInformationBlockPos

No UE requirements related to the contents of the *SystemInformationBlockPos* apply other than those specified elsewhere e.g. within TS 36.355 [54], and/or within the corresponding field descriptions.

5.2.3 Acquisition of an SI message

When acquiring an SI message, the UE shall:

- 1> determine the start of the SI-window for the concerned SI message as follows:
 - 2> if the concerned SI message is configured in the *schedulingInfoList* or if the concerned SI message is configured in the *pos-schedulingInfoList* and *si-posOffset* is not configured;
 - 3> for the concerned SI message, determine the number n which corresponds to the order of entry in the concatenated list of SI messages configured by *schedulingInfoList* and *posSchedulingInfoList* in *SystemInformationBlockType1*;
 - 3> determine the integer value $x = (n 1)^*w$, where *w* is the *si*-WindowLength;
 - 3> the SI-window starts at the subframe #a, where $a = x \mod 10$, in the radio frame for which SFN mod T = FLOOR(x/10), where *T* is the *si-Periodicity* of the concerned SI message;
 - 2> else if the concerned SI message is configured by the *posSchedulingInfoList* and *si-posOffset* is configured determine the start of the SI-window for the concerned SI message as follows:
 - 3> determine the number *m* which corresponds to the number of SI messages with an associated *si-Periodicity* of 8 radio frames (80 ms), configured by *schedulingInfoList* in *SystemInformationBlockType1*;
 - 3> for the concerned SI message, determine the number n which corresponds to the order of entry in the list of SI messages configured by posSchedulingInfoList in SystemInformationBlockType1;
 - 3> determine the integer value $x = m^*w + (n-1)^*w$, where *w* is the *si-WindowLength*
 - 3> the SI-window starts at the subframe #*a*, where $a = x \mod 10$, in the radio frame for which SFN mod T = FLOOR(x/10) + 8, where *T* is the *si-posPeriodicity* of the concerned SI message;
- NOTE: E-UTRAN should configure an SI-window of 1 ms only if all SIs are scheduled before subframe #5 in radio frames for which SFN mod 2 = 0.
- 1> receive DL-SCH using the SI-RNTI from the start of the SI-window and continue until the end of the SI-window whose absolute length in time is given by *si-WindowLength*, or until the SI message was received, excluding the following subframes:
 - 2> subframe #5 in radio frames for which SFN mod 2 = 0;
 - 2> any MBSFN subframes;
 - 2> any uplink subframes in TDD;

1> if the SI message was not received by the end of the SI-window, repeat reception at the next SI-window occasion for the concerned SI message;

5.2.3a Acquisition of an SI message by BL UE or UE in CE or a NB-IoT UE

When acquiring an SI message, the BL UE or UE in CE or NB-IoT UE shall:

- 1> determine the start of the SI-window for the concerned SI message as follows:
 - 2> if the concerned SI message is configured in the *schedulingInfoList* or if the concerned SI message is configured in the *pos-schedulingInfoList* and *si-posOffset* is not configured;
 - 3> for the concerned SI message, determine the number n which corresponds to the order of entry in the concatenated list of SI messages configured by *schedulingInfoList* in *SystemInformationBlockType1-BR* (or *SystemInformationBlockType1-NB* in NB-IoT) and *posSchedulingInfoList* in *SystemInformationBlockType1-BR*;
 - 3> determine the integer value $x = (n 1)^*w$, where *w* is the *si-WindowLength-BR* (or *si-WindowLength* in NB-IoT);
 - 2> else if the concerned SI message is configured by the *posSchedulingInfoList* and *si-posOffset* is configured determine the start of the SI-window for the concerned SI message as follows:
 - 3> determine the number *m* which corresponds to the number of SI messages with an associated *si*-*Periodicity* of 8 radio frames (80 ms), configured by *schedulingInfoList* in *SystemInformationBlockType1-BR*;
 - 3> for the concerned SI message, determine the number n which corresponds to the order of entry in the list of SI messages configured by posSchedulingInfoList in SystemInformationBlockType1-BR;
 - 3> determine the integer value $x = m^*w + (n-1)^*w$, where w is the *si-WindowLength-BR*
 - 3> the SI-window starts at the subframe #*a*, where $a = x \mod 10$, in the radio frame for which SFN mod T = FLOOR(x/10) + 8, where *T* is the *si-posPeriodicity* of the concerned SI message;
 - 2> if the UE is a NB-IoT UE:
 - 3> the SI-window starts at the subframe #0 in the radio frame for which (H-SFN * 1024 + SFN) mod T = FLOOR(x/10) + Offset, where *T* is the *si-Periodicity* of the concerned SI message and, Offset is the offset of the start of the SI-Window (*si-RadioFrameOffset*);

2> else:

- 3> the SI-window starts at the subframe #0 in the radio frame for which SFN mod T = FLOOR(x/10), where *T* is the *si-Periodicity* of the concerned SI message;
- 1> if the UE is a NB-IoT UE:
 - 2> receive and accumulate SI message transmissions on DL-SCH from the start of the SI-window and continue until the end of the SI-window whose absolute length in time is given by *si-WindowLength*, starting from the radio frames as provided in *si-RepetitionPattern* and in subframes as provided in *downlinkBitmap*, or until successful decoding of the accumulated SI message transmissions excluding the subframes used for transmission of NPSS, NSSS, *MasterInformationBlock-NB/ MasterInformationBlock-TDD-NB* and *SystemInformationBlockType1-NB*. If there are not enough subframes for one SI message transmission in the radio frames as provided in *si-RepetitionPattern*, the UE shall continue to receive the SI message transmission in the radio frames following the radio frame indicated in *si-RepetitionPattern*;

1> else:

2> receive and accumulate SI message transmissions on DL-SCH on narrowband provided by *si-Narrowband*, from the start of the SI-window and continue until the end of the SI-window whose absolute length in time is given by *si-WindowLength-BR*, only in radio frames as provided in *si-RepetitionPattern* and subframes as provided in *fdd-DownlinkOrTddSubframeBitmapBR* in *bandwidthReducedAccessRelatedInfo*, or until successful decoding of the accumulated SI message transmissions;

1> if the SI message was not possible to decode from the accumulated SI message transmissions by the end of the SI-window, continue reception and accumulation of SI message transmissions on DL-SCH in the next SIwindow occasion for the concerned SI message;

5.2.3b Acquisition of an SI message from MBMS-dedicated cell

When acquiring an SI message, the UE shall:

- 1> determine the start of the SI-window for the concerned SI message as follows:
 - 2> for the concerned SI message, determine the number n which corresponds to the order of entry in the list of SI messages configured by *schedulingInfoList* in *SystemInformationBlockType1-MBMS*;
 - 2> determine the integer value $x = (n 1)^* w$, where *w* is the *si*-WindowLength;
 - 2> the SI-window starts always at the subframe #a, where $a = x \mod 10$, in the radio frame for which SFN mod T = FLOOR(x/10), where *T* is the *si-Periodicity* of the concerned SI message;
- 1> receive DL-SCH using SI-RNTI with value in accordance with 36.321 [6] from the start of the SI-window and continue until the end of the SI-window whose absolute length in time is given by *si-WindowLength*, or until the SI message was received, excluding the following subframes:
 - 2> any MBSFN subframes;
- 1> if the SI message was not received by the end of the SI-window, repeat reception at the next SI-window occasion for the concerned SI message;

5.3 Connection control

5.3.1 Introduction

5.3.1.1 RRC connection control

RRC connection establishment involves the establishment of SRB1. Except for EDT, E-UTRAN completes RRC connection establishment prior to completing the establishment of the S1 connection, i.e. prior to receiving the UE context information from the EPC. Consequently, AS security is not activated during the initial phase of the RRC connection. During this initial phase of the RRC connection, the E-UTRAN may configure the UE to perform measurement reporting, but the UE only sends the corresponding measurement reports after successful security activation. However, the UE only accepts a handover message when security has been activated.

NOTE 1: In case the serving frequency broadcasts multiple overlapping bands, E-UTRAN can only configure measurements after having obtained the UE capabilities, as the measurement configuration needs to be set according to the band selected by the UE.

Upon receiving the UE context from the EPC, E-UTRAN activates security (both ciphering and integrity protection) using the initial security activation procedure. The RRC messages to activate security (command and successful response) are integrity protected, while ciphering is started only after completion of the procedure. That is, the response to the message used to activate security is not ciphered, while the subsequent messages (e.g. used to establish SRB2 and DRBs) are both integrity protected and ciphered.

After having initiated the initial security activation procedure, E-UTRAN initiates the establishment of SRB2 and DRBs, i.e. E-UTRAN may do this prior to receiving the confirmation of the initial security activation from the UE. In any case, E-UTRAN will apply both ciphering and integrity protection for the RRC connection reconfiguration messages used to establish SRB2 and DRBs. E-UTRAN should release the RRC connection if the initial security activation and/ or the radio bearer establishment fails (i.e. security activation and DRB establishment are triggered by a joint S1-procedure, which does not support partial success).

For SRB2 and DRBs, security is always activated from the start, i.e. the E-UTRAN does not establish these bearers prior to activating security.

For some radio configuration fields, a critical extension has been defined. A switch from the original version of the field to the critically extended version is allowed using any connection reconfiguration. The UE reverts to the original

version of some critically extended fields upon handover and re-establishment as specified elsewhere in this specification. Otherwise, switching a field from the critically extended version to the original version is only possible using the handover or re-establishment procedure with the full configuration option. This also applies for fields that are critically extended within a release (i.e. original and extended version defined in same release).

After having initiated the initial security activation procedure, E-UTRAN may configure a UE that supports CA, with one or more SCells in addition to the PCell that was initially configured during connection establishment. The PCell is used to provide the security inputs and upper layer system information (i.e. the NAS mobility information e.g. TAI). SCells are used to provide additional downlink and optionally uplink radio resources. When not configured with any kind of DC, all SCells the UE is configured with, if any, are part of the MCG.

When configured with DC, some of the SCells are part of a SCG. In this case, user data carried by a DRB may either be transferred via MCG (i.e. MCG-DRB), via SCG (SCG-DRB) or via both MCG and SCG in DL while E-UTRAN configures the CG used in UL (split DRB). An RRC connection reconfiguration message may be used to change the DRB type from MCG-DRB to SCG-DRB or to split DRB, as well as from SCG-DRB or split DRB to MCG-DRB.

DC employs SCG change, which is a synchronous SCG reconfiguration procedure (i.e. involving RA to the PSCell) including reset/ re-establishment of layer 2 and, if SCG DRBs are configured, refresh of security. The procedure is used in a number of different scenarios e.g. SCG establishment, PSCell change, Key refresh, change of DRB type. The UE performs the SCG change related actions upon receiving an *RRCConnectionReconfiguration* message including *mobilityControlInfoSCG*, see 5.3.10.10.

In case of MR-DC, the cells of one CG use another RAT, namely NR. The configuration of an NR CG is specified in TS 38.331 [82]. When configured with MR-DC, user data carried by a DRB may either be transferred via MCG, via NR SCG or via both MCG and NR SCG. Also RRC signalling carried by a SRB may either be transferred via MCG or via both MCG and NR SCG. When DRBs and SRBs are configured with transmission via both MCG and SCG, duplication may be used in both DL and UL.

Change to NR PDCP or vice versa, that in case of EN-DC may be done for both SRBs and DRBs, can be performed using an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* (handover) by release and addition of the concerned RB (for DRBs) or of the concerned PDCP entity (for SRBs). The same *RRCConnectionReconfiguration* message may be used to make changes regarding the CG(s) used for transmission. For SRB1, change from E-UTRA PDCP to NR PDCP type may, before initial security activation, also be performed using an *RRCConnectionReconfiguration* message not including the *mobilityControlInfo*.

In case of (NG)EN-DC, there are three types of NR SCG reconfigurations:

- Reconfiguration with sync and key change i.e. a procedure involving RA to the PSCell, including NR MAC reset, re-establishment of NR RLC and NR PDCP and refresh of NR SCG security; and
- Reconfiguration with sync but without key change i.e. a procedure involving RA to the PSCell, including NR MAC reset and NR RLC re-establishment and PDCP data recovery (for AM DRB); and
- Regular NR SCG reconfiguration neither involving refresh of NR SCG security, nor RA to the PSCell, NR MAC reset or NR RLC re-establishment;

The network is only required to use the NR SCG reconfiguration with sync and key change in case the NR SCG security key changes (i.e. handover, change of SNs, S-KgNB refresh). Further details are specified in NR RRC TS 38.331 [82].

NOTE 2: In case of MR-DC, E-UTRA RRC configuration parameters should only affect E-UTRA operation. E.g., *s-Measure* only affects measurements configured by parameters defined in this specification. Should an E-UTRA RRC configuration change require a change of NR RRC configuration, the network should indicate such NR change by NR RRC signalling. E.g. a specific indication is used to trigger RLC re-establishment upon reconfigurations changing the CG(s) used for transmission (in DL or UL) that otherwise would only involve NR RRC signalling.

In this release of the specification, change between DC and MR-DC as well as change between DC and E-UTRA configured with SN terminated DRB without SCG are not supported (i.e. neither the direct reconfiguration nor specific measurement events). Likewise, the direct transition between MR-DC and NR DC is not supported in this release of the specification.

The release of the RRC connection normally is initiated by E-UTRAN. The procedure may be used to re-direct the UE to an E-UTRA frequency or an inter-RAT carrier frequency. Only in exceptional cases, as specified within this

specification, TS 36.300 [9], TS 36.304 [4] or TS 24.301 [35], may the UE abort the RRC connection, i.e. move to RRC_IDLE without notifying E-UTRAN.

The suspension of the RRC connection is initiated by E-UTRAN. When the RRC connection is suspended, the UE stores the UE AS context and the *resumeIdentity*, and transitions to RRC_IDLE state. The RRC message to suspend the RRC connection is integrity protected and ciphered. Suspension can only be performed when at least 1 DRB is successfully established.

The resumption of a suspended RRC connection is initiated by upper layers when the UE has a stored UE AS context, RRC connection resume is permitted by E-UTRAN and the UE needs to transit from RRC_IDLE state to RRC_CONNECTED state. When the RRC connection is resumed, RRC configures the UE according to the RRC connection resume procedure based on the stored UE AS context and any RRC configuration received from E-UTRAN. The RRC connection resume procedure re-activates security and re-establishes SRB(s) and DRB(s). The request to resume the RRC connection includes the *resumeIdentity*. The request is not ciphered, but protected with a message authentication code.

In response to a request to resume the RRC connection, E-UTRAN may resume the suspended RRC connection, reject the request to resume and instruct the UE to either keep or discard the stored context, or setup a new RRC connection.

In case of CP-EDT, the data are appended in the *RRCEarlyDataRequest* and *RRCEarlyDataComplete* messages, if available, and sent over SRB0. In case of UP-EDT, security is re-activated prior to transmission of RRC message using the *nextHopChainingCount* provided in the *RRCConnectionRelease* message with suspend indication during the preceding suspend procedure and the radio bearers are re-established. The uplink data are transmitted ciphered on DTCH multiplexed with the *RRCConnectionRelease* message on CCCH. In the downlink, the data, if available, are transmitted on DTCH multiplexed with the *RRCConnectionRelease* message on DCCH. In response to a request for EDT, E-UTRAN may also choose to establish or resume the RRC connection.

A UE in RRC_CONNECTED enters RRC_INACTIVE when the network indicates RRC connection suspension in *RRCConnectionRelease* message. When entering RRC_INACTIVE, the UE stores the UE AS context and any RRC configuration received from the network.

The resumption of an RRC connection from RRC_INACTIVE is initiated by upper layers when the UE needs to transit from RRC_INACTIVE state to RRC_CONNECTED state or by RRC layer for, e.g. RNAU or reception of RAN paging. When the RRC connection is resumed, network configures the UE according to the RRC connection resume procedure based on the stored UE AS context and any RRC configuration received from the network. The RRC connection resume procedure re-activates security and re-establishes SRB(s) and DRB(s).

In response to a request to resume the RRC connection from RRC_INACTIVE, the network may resume the suspended RRC connection and UE enters to RRC_CONNECTED, or reject the request to resume using RRC message without security protection and send UE to RRC_INACTIVE with wait time, or directly re-suspend the RRC connection and send UE to RRC_INACTIVE, or directly release the RRC connection and send UE to RRC_IDLE, or instruct the UE to initiate NAS level recovery.

5.3.1.2 Security

AS security comprises of the integrity protection of RRC signalling (SRBs) as well as the ciphering of RRC signalling (SRBs) and user data (DRBs).

RRC handles the configuration of the security parameters which are part of the AS configuration: the integrity protection algorithm, the ciphering algorithm and two parameters, namely the *keyChangeIndicator* and the *nextHopChainingCount*, which are used by the UE to determine the AS security keys upon handover, connection re-establishment, connection resume and/ or UP-EDT.

The integrity protection algorithm is common for signalling radio bearers SRB1, SRB2 and SRB4. When configured with MCG only, the ciphering algorithm is common for all radio bearers (i.e. SRB1, SRB2, SRB4 and DRBs). Neither integrity protection nor ciphering applies for SRB0.

RRC integrity and ciphering are always activated together, i.e. in one message/ procedure. RRC integrity and ciphering are never de-activated. However, it is possible to switch to a 'NULL' ciphering algorithm (eea0).

The 'NULL' integrity protection algorithm (eia0) is used only for the UE in limited service mode, as specified in TS 33.401 [32]. In case the 'NULL' integrity protection algorithm is used, 'NULL' ciphering algorithm is also used.

NOTE 1: Lower layers discard RRC messages for which the integrity check has failed and indicate the integrity verification check failure to RRC.

The AS applies three different security keys: one for the integrity protection of RRC signalling (K_{RRCint}), one for the ciphering of RRC signalling (K_{RRCenc}) and one for the ciphering of user data (K_{UPenc}). All three AS keys are derived from the K_{eNB} key. The K_{eNB} is based on the K_{ASME} key for E-UTRA/EPC, or K_{AMF} for E-UTRA/5GC, which is handled by upper layers.

Upon connection establishment new AS keys are derived. No AS-parameters are exchanged to serve as inputs for the derivation of the new AS keys at connection establishment.

The integrity and ciphering of the RRC message used to perform handover is based on the security configuration used prior to the handover and is performed by the source eNB.

The integrity and ciphering algorithms can only be changed upon handover. The four AS keys (K_{eNB} , K_{RRCint} , K_{RRCenc} and K_{UPenc}) change upon every handover, connection re-establishment, connection resume and UP-EDT. The *keyChangeIndicator* is used upon handover and indicates whether the UE should use the keys associated with the K_{ASME} key for E-UTRA/EPC, or K_{AMF} for E-UTRA/5GC, taken into use with the latest successful NAS SMC procedure. The *nextHopChainingCount* parameter is used upon handover, connection re-establishment, connection resume and UP-EDT by the UE when deriving the new K_{eNB} that is used to generate K_{RRCint} , K_{RRCenc} and K_{UPenc} (see TS 33.401 [32]). An intra cell handover procedure may be used to change the keys in RRC_CONNECTED.

For each radio bearer an independent counter (COUNT, as specified in TS 36.323 [8] for E-UTRA/EPC, and TS 38.323 [83] for E-UTRA/5GC) is maintained for each direction. For each DRB, the COUNT is used as input for ciphering. For each SRB, the COUNT is used as input for both ciphering and integrity protection. It is not allowed to use the same COUNT value more than once for a given security key. At connection resume the COUNT is reset. In order to limit the signalling overhead, individual messages/ packets include a short sequence number (PDCP SN, as specified in TS 36.323 [8] for E-UTRA/EPC, and TS 38.323 [83] for E-UTRA/5GC). In addition, an overflow counter mechanism is used: the hyper frame number (TX_HFN and RX_HFN, as specified in TS 36.323 [8] for E-UTRA/EPC, and TS 38.323 [83] for E-UTRA/5GC). The HFN needs to be synchronized between the UE and the eNB. The eNB is responsible for avoiding reuse of the COUNT with the same RB identity and with the same K_{eNB}, e.g. due to the transfer of large volumes of data, release and establishment of new RBs. In order to avoid such re-use, the eNB may e.g. use different RB identities for successive RB establishments, trigger an intra cell handover or by triggering a transition from RRC_CONNECTED to RRC_IDLE or RRC_INACTIVE and then back to RRC_CONNECTED.

For each SRB, the value provided by RRC to lower layers to derive the 5-bit BEARER parameter used as input for ciphering and for integrity protection is the value of the corresponding *srb-Identity* with the MSBs padded with zeroes.

With E-UTRA/5GC for a UE not capable of NGEN-DC, the same ciphering algorithm signalled at SMC or handover is used for all radio bearers. Likewise, the same integrity algorithm signalled at SMC or handover is used for all SRBs.

In case of DC, a separate K_{eNB} is used for SCG-DRBs (S- K_{eNB}). This key is derived from the key used for the MCG (K_{eNB}) and an SCG counter that is used to ensure freshness. To refresh the S- K_{eNB} e.g. when the COUNT will wrap around, E-UTRAN employs an SCG change, i.e. an *RRCConnectionReconfiguration* message including *mobilityControlInfoSCG*. When performing handover, while at least one SCG-DRB remains configured, both K_{eNB} and S- K_{eNB} are refreshed. In such case E-UTRAN performs handover with SCG change i.e. an *RRCConnectionReconfiguration* message including both *mobilityControlInfoSCG*. The ciphering algorithm is common for all radio bearers within a CG but may be different between MCG and SCG. The ciphering algorithm for SCG DRBs can only be changed upon SCG change.

In case of (NG)EN-DC or of SN terminated RB without SCG, the network indicates whether the UE shall use either K_{eNB} or S-K_{gNB} for a particular DRB. In case of NE-DC, the network indicates whether the UE shall use either K_{gNB} or S-K_{eNB} for a particular DRB. S-K_{gNB}/S-K_{eNB} is derived from K_{eNB}/K_{gNB} as defined in TS 33.501 [86], uses a different counter (*sk-Counter*) and is used only for DRBs using NR PDCP. Whenever there is a need to refresh S-K_{gNB}/S-K_{eNB}, e.g. upon change of MN or SN, the NR SCG reconfiguration with sync and key change is used for S-K_{gNB} refresh (see 5.3.1.1) and the *RRCConnectionReconfiguration* message including *mobilityControlInfoSCG* is used for S-K_{eNB} refresh (see 5.3.10.10). E-UTRAN provides a UE configured with (NG)EN-DC with an *sk-Counter* even when no DRB is setup using S-K_{gNB} i.e. to facilitate configuration of SRB3. The same ciphering algorithm as signalled by *nr-RadioBearerConfig1* and *nr-RadioBearerConfig2* as defined in TS 38.331 [82] is used for all radio bearers using the same key (i.e. K_{eNB} or S-K_{gNB}). Likewise, the same integrity algorithm as signalled by *nr-RadioBearerConfig2* as defined in TS 38.331 [82] is used for all radio bearers using the same key for the security algorithms than E-UTRA, the actual algorithms are the same in case of (NG)EN-DC and NE-DC in this version of the specification. Hence, for such algorithms, the security capabilities supported by a UE

are consistent across these RATs. For MR-DC, integrity protection is not enabled for DRBs terminated on eNB or when the master node is an ng-eNB.

NOTE 2: The network ensures that different values are used for the SCG counter and for the *sk-Counter* when deriving S-K_{gNB} and/or S-K_{eNB} from the same master key.

5.3.1.2a RN security

For RNs, AS security follows the procedures in 5.3.1.2. Furthermore, E-UTRAN may configure per DRB whether or not integrity protection is used. The use of integrity protection may be configured only upon DRB establishment and reconfigured only upon handover or upon the first reconfiguration following RRC connection re-establishment.

To provide integrity protection on DRBs between the RN and the E-UTRAN, the K_{UPint} key is derived from the K_{eNB} key as described in TS 33.401 [32]. The same integrity protection algorithm used for SRBs also applies to the DRBs. The K_{UPint} changes at every handover and RRC connection re-establishment and is based on an updated K_{eNB} which is derived by taking into account the *nextHopChainingCount*. The COUNT value maintained for DRB ciphering is also used for integrity protection, if the integrity protection is configured for the DRB.

5.3.1.3 Connected mode mobility

In RRC_CONNECTED, the network controls UE mobility, i.e. the network decides when the UE shall connect to which E-UTRA cell(s), or inter-RAT cell. For network controlled mobility in RRC_CONNECTED, the PCell can be changed using an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* (handover), whereas the SCell(s) can be changed using the *RRCConnectionReconfiguration* message either with or without the *mobilityControlInfo*.

In DC, an SCG can be established, reconfigured or released by using an *RRCConnectionReconfiguration* message with or without the *mobilityControlInfo*. In case Random Access to the PSCell or initial PUSCH transmission to the PSCell if *rach-SkipSCG* is configured is required upon SCG reconfiguration, E-UTRAN employs the SCG change procedure (i.e. an *RRCConnectionReconfiguration* message including the *mobilityControlInfoSCG*). The PSCell can only be changed using the SCG change procedure and by release and addition of the PSCell.

In (NG)EN-DC, an NR SCG can be established or reconfigured by using an *RRCConnectionReconfiguration* message containing *nr-secondaryCellGroupConfig* and *nr-RadioBearerConfig*. The contents of *nr-secondaryCellGroupConfig* and *nr-RadioBearerConfig*, of other (NG)EN-DC fields as well as the associated procedures are specified in TS 38.331 [82]. In (NG)EN-DC, the PSCell can only be changed using the Reconfiguration with sync procedure, with or without MR-DC release and addition.

The network triggers the handover procedure e.g. based on radio conditions, load. To facilitate this, the network may configure the UE to perform measurement reporting (possibly including the configuration of measurement gaps). The network may also initiate handover blindly, i.e. without having received measurement reports from the UE.

Before sending the handover message to the UE, the source eNB prepares one or more target cells. The source eNB selects the target PCell. The source eNB may also provide the target eNB with a list of best cells on each frequency for which measurement information is available, in order of decreasing RSRP. The source eNB may also include available measurement information for the cells provided in the list. The target eNB decides which SCells are configured for use after handover, which may include cells other than the ones indicated by the source eNB. If an SCG is configured, handover involves either SCG release or either SCG change (in case of DC) or an NR SCG reconfiguration with sync and key change (in case of EN-DC and NGEN-DC). In case the UE was configured with (EN-) DC or NGEN-DC, the target eNB indicates in the handover message whether the UE shall release the entire (NR) SCG configuration. Upon connection re-establishment, the UE releases the entire SCG configuration except for the DRB configuration, while E-UTRAN in the first reconfiguration message following the re-establishment either releases the DRB(s) to MCG DRB(s).

The target eNB generates the message used to perform the handover, i.e. the message including the AS-configuration to be used in the target cell(s). The source eNB transparently (i.e. does not alter values/ content) forwards the handover message/ information received from the target to the UE. When appropriate, the source eNB may initiate data forwarding for (a subset of) the DRBs.

After receiving the handover message, the UE attempts to access the target PCell at the first available RACH occasion according to Random Access resource selection defined in TS 36.321 [6], i.e. the handover is asynchronous, or at the first available PUSCH occasion if *rach-Skip* is configured. Consequently, when allocating a dedicated preamble for the random access in the target PCell, E-UTRA shall ensure it is available from the first RACH occasion the UE may use.

The first available PUSCH occasion is provided by *ul-ConfigInfo*, if configured, otherwise UE shall monitor the PDCCH of target eNB. Upon successful completion of the handover, the UE sends a message used to confirm the handover.

If the target eNB does not support the release of RRC protocol which the source eNB used to configure the UE, the target eNB may be unable to comprehend the UE configuration provided by the source eNB. In this case, the target eNB should use the full configuration option to reconfigure the UE for Handover and Re-establishment. Full configuration option includes an initialization of the radio configuration, which makes the procedure independent of the configuration used in the source cell(s) with the exception that the security algorithms are continued for the RRC re-establishment.

The same behavior applies in (NG)EN-DC, if upon handover the target eNB is unable to comprehend the MCG part of the UE configuration i.e. the target eNB uses the full configuration option which involves release and configuration of (most of the) MCG and NR SCG configuration. In case of (NG)EN-DC, the target SgNB may be unable to comprehend the NR SCG configuration provided by the source SgNB. In such a case, release and addition may be applied for the NR SCG part of the configuration.

NOTE 1: When using release and addition for the NR SCG configuration, E-UTRAN includes *drb-ToReleaseList* for the SN terminated RBs.

After the successful completion of handover, PDCP SDUs may be re-transmitted in the target cell(s). This only applies for DRBs using RLC-AM mode and for handovers not involving full configuration option. The further details are specified in TS 36.323 [8]. After the successful completion of handover not involving full configuration option, the SN and the HFN are reset except for the DRBs using RLC-AM mode (for which both SN and HFN continue). For reconfigurations involving the full configuration option, the PDCP entities are newly established (SN and HFN do not continue) for all DRBs irrespective of the RLC mode. The further details are specified in TS 36.323 [8].

One UE behaviour to be performed upon handover is specified, i.e. this is regardless of the handover procedures used within the network (e.g. whether the handover includes X2 or S1 signalling procedures).

The source eNB should, for some time, maintain a context to enable the UE to return in case of handover failure. After having detected handover failure, the UE attempts to resume the RRC connection either in the source PCell or in another cell using the RRC re-establishment procedure. This connection resumption succeeds only if the accessed cell is prepared, i.e. concerns a cell of the source eNB or of another eNB towards which handover preparation has been performed. The cell in which the re-establishment procedure succeeds becomes the PCell while SCells and STAGs, if configured, are released.

Normal measurement and mobility procedures are used to support handover to cells broadcasting a CSG identity. In addition, E-UTRAN may configure the UE to report that it is entering or leaving the proximity of cell(s) included in its CSG whitelist. Furthermore, E-UTRAN may request the UE to provide additional information broadcast by the handover candidate cell e.g. global cell identity, CSG identity, CSG membership status.

NOTE 2: E-UTRAN may use the 'proximity report' to configure measurements as well as to decide whether or not to request additional information broadcast by the handover candidate cell. The additional information is used to verify whether or not the UE is authorised to access the target PCell and may also be needed to identify handover candidate cell (*PCI confusion* i.e. when the physical layer identity that is included in the measurement report does not uniquely identify the cell).

5.3.1.4 Connection control in NB-IoT

In NB-IoT, during the RRC connection establishment procedure, SRB1bis is established implicitly with SRB1. SRB1bis uses the logical channel identity defined in 9.1.2a, with the same configuration as SRB1 but no PDCP entity. SRB1bis is used until security is activated. The RRC messages to activate security (command and successful response) are sent over SRB1 being integrity protected and ciphering is started after completion of the procedure. In case of unsuccessful security activation, the failure message is sent over SRB1 and subsequent messages are sent over SRB1bis. Once security is activated, new RRC messages shall be transmitted using SRB1. A NB-IoT UE that only supports the Control Plane CIoT EPS optimisation (see TS 24.301 [35]) only establishes SRB1bis.

A NB-IoT UE only supports 0, 1 or 2 DRBs, depending on its capability. A NB-IoT UE that only supports the Control Plane CIoT EPS optimisation (see TS 24.301 [35]) does not need to support any DRBs and associated procedures.

Table 5.3.1.4-1 lists the procedures that are applicable for NB-IoT. All other procedures are not applicable; this is not further stated in the corresponding procedures.

Sub-clause	Procedures
5.3.2	Paging
5.3.3	RRC connection establishment
	RRC connection resume (see NOTE)
	CP-EDT
	UP-EDT (see NOTE)
5.3.4	Initial security activation (see NOTE)
5.3.5	RRC connection reconfiguration (see NOTE)
5.3.7	RRC connection re-establishment
5.3.8	RRC connection release
5.3.9	RRC connection release requested by upper layers
5.3.10	Radio resource configuration
5.3.11	Radio link failure related actions
5.3.12	UE actions upon leaving RRC_CONNECTED

Table 5.3.1.4-1: Connection control procedures applicable to a NB-IoT UE

NOTE: Not applicable for a UE that only supports the Control Plane CIoT EPS optimisation (see TS 24.301 [35]).

5.3.2 Paging

5.3.2.1 General



Figure 5.3.2.1-1: Paging

The purpose of this procedure is:

- to transmit CN initiated paging information to a UE in RRC_IDLE or RRC_INACTIVE and/ or;
- to transmit RAN initiated paging information to a UE in RRC_INACTIVE and/or;
- to inform UEs in RRC_IDLE, UEs in RRC_INACTIVE and UEs in RRC_CONNECTED other than NB-IoT UEs, BL UEs and UEs in CE, about a system information change and/ or;
- to inform UEs in RRC_IDLE other than NB-IoT UEs, UEs in RRC_INACTIVE and UEs in RRC_CONNECTED other than NB-IoT UEs, BL UEs and UEs in CE, about an ETWS primary notification and/ or ETWS secondary notification and/ or;
- to inform UEs in RRC_IDLE other than NB-IoT UEs, UEs in RRC_INACTIVE and UEs in RRC_CONNECTED other than NB-IoT UEs, BL UEs and UEs in CE, about a CMAS notification and/or;
- to inform UEs other than NB-IoT UEs in RRC_IDLE, and other than UEs connected to 5GC about an EAB parameters modification and/ or;
- to inform UEs other than NB-IoT UEs in RRC_IDLE, and UEs in RRC_INACTIVE to perform E-UTRAN inter-frequency redistribution procedure.

The paging information of CN initiated paging is provided to upper layers, which in response may initiate RRC connection establishment, e.g. to receive an incoming call.

5.3.2.2 Initiation

E-UTRAN initiates the paging procedure by transmitting the *Paging* message at the UE's paging occasion as specified in TS 36.304 [4]. E-UTRAN may address multiple UEs within a *Paging* message by including one *PagingRecord* for each UE. E-UTRAN may also indicate a change of system information, and/ or provide an ETWS notification or a CMAS notification in the *Paging* message.

5.3.2.3 Reception of the *Paging* message by the UE

Upon receiving the Paging message, the UE shall:

- 1> if in RRC_IDLE, for each of the *PagingRecord*, if any, included in the *Paging* message:
 - 2> if the *ue-Identity* included in the *PagingRecord* matches one of the UE identities allocated by upper layers:
 - 3> forward the *ue-Identity, accessType* (if present) and, except for NB-IoT, the *cn-Domain* to the upper layers;
- 1> if in RRC_INACTIVE, for each of the *PagingRecord*, if any, included in the *Paging* message:
 - 2> if the *ue-Identity* included in the *PagingRecord* matches the stored *fullI-RNTI*:
 - 3> if UE is configured with one or more access identities equal to 1, 2 or 11-15 applicable in the selected PLMN:
 - 4> initiate RRC connection resume procedure in 5.3.3.2 with cause value set to 'highProrityAccess';
 - 3> else:
 - 4> initiate the RRC connection resumption procedure according to 5.3.3.2 with cause value set to 'mtaccess';
 - 2> else if the *ue-Identity* included in the *PagingRecord* matches one of the UE identities allocated by upper layers:
 - 3> forward the *ue-Identity, accessType* (if present) and the *cn-Domain* to the upper layers;
 - 3> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12, with release cause 'other';
- 1> if the UE is not configured with a DRX cycle longer than the modification period and the *systemInfoModification* is included; or
- 1> if the UE is configured with a DRX cycle longer than the modification period and the *systemInfoModificationeDRX* is included:
 - 2> re-acquire the required system information using the system information acquisition procedure as specified in 5.2.2.
- 1> if the *etws-Indication* is included and the UE is ETWS capable:
 - 2> re-acquire SystemInformationBlockType1 immediately, i.e., without waiting until the next system information modification period boundary;
 - 2> if the *schedulingInfoList* indicates that *SystemInformationBlockType10* is present:

3> acquire SystemInformationBlockType10;

NOTE: If the UE is in CE, it is up to UE implementation when to start acquiring SystemInformationBlockType10.

- 2> if the schedulingInfoList indicates that SystemInformationBlockType11 is present:
 - 3> acquire SystemInformationBlockType11;
- 1> if the *cmas-Indication* is included and the UE is CMAS capable:
 - 2> re-acquire SystemInformationBlockType1 immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.5;

2> if the schedulingInfoList indicates that SystemInformationBlockType12 is present:

3> acquire SystemInformationBlockType12;

1> if in RRC_IDLE, the *eab-ParamModification* is included and the UE is EAB capable:

2> consider previously stored SystemInformationBlockType14 as invalid;

- 2> re-acquire *SystemInformationBlockType1* immediately, i.e., without waiting until the next system information modification period boundary as specified in 5.2.1.6;
- 2> re-acquire SystemInformationBlockType14 using the system information acquisition procedure as specified in 5.2.2.4;
- 1> if in RRC_IDLE, the *redistributionIndication* is included and the UE is redistribution capable:

2> Perform E-UTRAN inter-frequency redistribution procedure as specified in TS 36.304 [4], clause 5.2.4.10;

5.3.3 RRC connection establishment

5.3.3.1 General

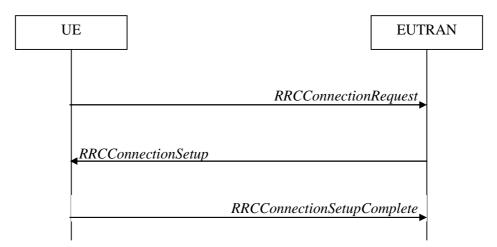
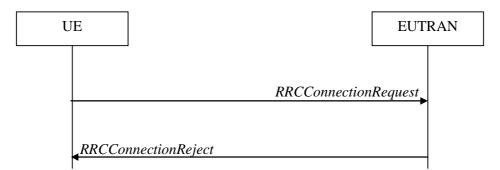
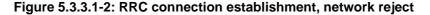


Figure 5.3.3.1-1: RRC connection establishment, successful





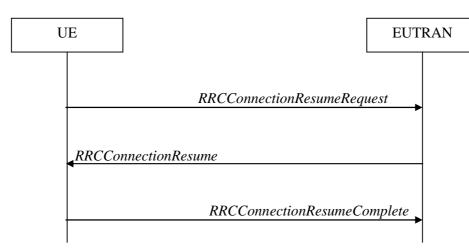


Figure 5.3.3.1-3: RRC connection resume (suspended RRC connection or RRC_INACTIVE), or UP-EDT fallback to RRC connection resume, successful

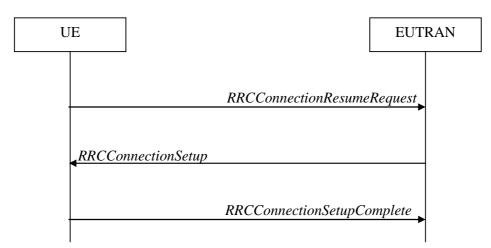


Figure 5.3.3.1-4: RRC connection resume (suspended RRC connection or RRC_INACTIVE) or UP-EDT fallback to RRC connection establishment, successful

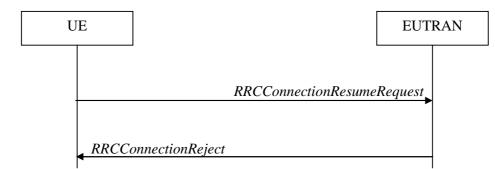
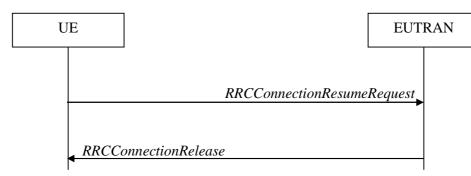
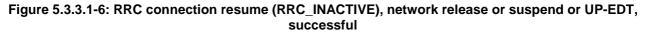


Figure 5.3.3.1-5: RRC connection resume or UP-EDT, network reject (suspended RRC connection or RRC_INACTIVE) or release (suspended RRC connection)





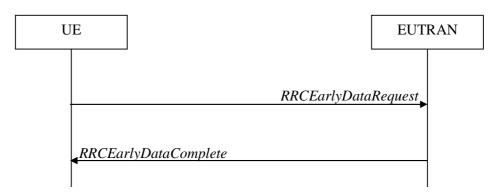


Figure 5.3.3.1-7: CP-EDT, successful

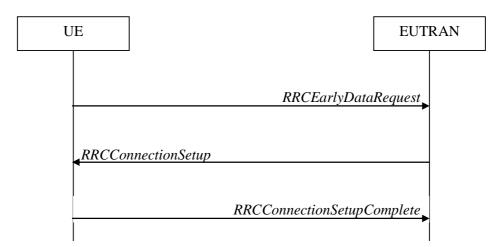


Figure 5.3.3.1-8: CP-EDT fallback to RRC connection establishment, successful

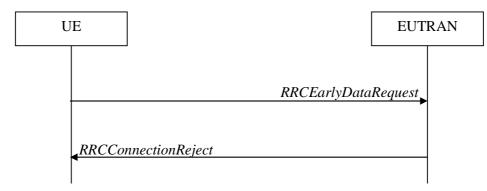


Figure 5.3.3.1-9: CP-EDT, network reject

The purpose of this procedure is to establish an RRC connection, to resume a suspended RRC connection, to move the UE from RRC_INACTIVE to RRC_CONNECTED or to perform EDT. RRC connection establishment involves SRB1 (and SRB1bis for NB-IoT) establishment. The procedure is also used to transfer the initial NAS dedicated information/ message from the UE to E-UTRAN.

E-UTRAN applies the procedure as follows:

- When establishing an RRC connection:
 - to establish SRB1 and, for NB-IoT, SRB1bis;
- When resuming an RRC connection from a suspended RRC connection or from RRC_INACTIVE:
 - to restore the AS configuration from a stored context including resuming SRB(s) and DRB(s);
- When performing EDT.

5.3.3.1a Conditions for establishing RRC Connection for sidelink communication/ discovery/ V2X sidelink communication

For sidelink communication an RRC connection is initiated only in the following case:

- 1> if configured by upper layers to transmit non-relay related sidelink communication and related data is available for transmission:
 - 2> if SystemInformationBlockType18 is broadcast by the cell on which the UE camps; and if the valid version of SystemInformationBlockType18 does not include commTxPoolNormalCommon;
- 1> if configured by upper layers to transmit relay related sidelink communication:
 - 2> if the UE is acting as sidelink relay UE; and if *SystemInformationBlockType18* is broadcast by the cell on which the UE camps; or
 - 2> if the UE has a selected sidelink relay UE; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met and if *SystemInformationBlockType18* is broadcast by the cell on which the UE camps; and if the valid version of *SystemInformationBlockType18* does not include *commTxPoolNormalCommon* or *commTxAllowRelayCommon*;

For V2X sidelink communication an RRC connection is initiated only in the following case:

- 1> if configured by upper layers to transmit non-P2X related V2X sidelink communication and related data is available for transmission:
 - 2> if the frequency on which the UE is configured to transmit non-P2X related V2X sidelink communication concerns the camped frequency; and if *SystemInformationBlockType21* is broadcast by the cell on which the UE camps; and if the valid version of *SystemInformationBlockType21* includes *sl-V2X-ConfigCommon*; and *sl-V2X-ConfigCommon* does not include *v2x-CommTxPoolNormalCommon*; or
 - 2> if the frequency on which the UE is configured to transmit non-P2X related V2X sidelink communication is included in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 broadcast by the cell on which the UE camps; and if neither the valid version of SystemInformationBlockType21 nor that of SystemInformationBlockType26 includes v2x-CommTxPoolNormal for the concerned frequency;
- 1> if configured by upper layers to transmit P2X related V2X sidelink communication and related data is available for transmission:
 - 2> if the frequency on which the UE is configured to transmit P2X related V2X sidelink communication concerns the camped frequency; and if *SystemInformationBlockType21* is broadcast by the cell on which the UE camps; and if the valid version of *SystemInformationBlockType21* includes *sl-V2X-ConfigCommon*; and *sl-V2X-ConfigCommon* does not include *p2x-CommTxPoolNormalCommon*; or
 - 2> if the frequency on which the UE is configured to transmit P2X related V2X sidelink communication is included in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 broadcast by the cell on which the UE camps; and if neither the valid version of

SystemInformationBlockType21 nor that of *SystemInformationBlockType26* includes *p2x-CommTxPoolNormal* for the concerned frequency;

For sidelink discovery an RRC connection is initiated only in the following case:

- 1> if configured by upper layers to transmit non-PS related sidelink discovery announcements:
 - 2> if the frequency on which the UE is configured to transmit non-PS related sidelink discovery announcements concerns the camped frequency; and *SystemInformationBlockType19* of the cell on which the UE camps does not include *discTxPoolCommon-r12*; or
 - 2> if the frequency on which the UE is configured to transmit non-PS related sidelink discovery announcements is included in *discInterFreqList* in *SystemInformationBlockType19* broadcast by the cell on which the UE camps, with *discTxResourcesInterFreq* included within *discResourcesNonPS* and set to *requestDedicated*;

1> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements:

- 2> if the frequency on which the UE is configured to transmit non-relay PS related sidelink discovery announcements concerns the camped frequency; and *SystemInformationBlockType19* of the cell on which the UE camps includes *discConfigPS* but does not include *discTxPoolPS-Common*; or
- 2> if the frequency on which the UE is configured to transmit non-relay PS related sidelink discovery announcements (e.g. group member discovery) is included in *discInterFreqList* in *SystemInformationBlockType19* broadcast by the cell on which the UE camps, with *discTxResourcesInterFreq* within *discResourcesPS* included and set to *requestDedicated*;
- 1> if configured by upper layers to transmit relay PS related sidelink discovery announcements:
 - 2> if the UE is acting as sidelink relay UE; and if the sidelink relay UE threshold conditions as specified in 5.10.10.4 are met; or
 - 2> if the UE is selecting a sidelink relay UE / has a selected sidelink relay UE; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met:
 - 3> if the frequency on which the UE is configured to transmit relay PS related sidelink discovery announcements concerns the camped frequency; and *SystemInformationBlockType19* of the cell on which the UE camps includes *discConfigRelay* and *discConfigPS* but does not include *discTxPoolPS-Common*;
- NOTE: Upper layers initiate an RRC connection. The interaction with NAS is left to UE implementation.

5.3.3.1b Conditions for initiating EDT

- A BL UE, UE in CE or NB-IoT UE can initiate EDT when all of the following conditions are fulfilled:
 - 1> for CP-EDT, the upper layers request establishment of an RRC connection, the UE supports CP-EDT, and *SystemInformationBlockType2* (*SystemInformationBlockType2-NB* in NB-IoT) includes *cp-EDT*; or
 - 1> for UP-EDT, the upper layers request resumption of an RRC connection, the UE supports UP-EDT, SystemInformationBlockType2 (SystemInformationBlockType2-NB in NB-IoT) includes up-EDT, and the UE has a stored value of the nextHopChainingCount provided in the RRCConnectionRelease message with suspend indication during the preceding suspend procedure;
 - 1> the establishment or resumption request is for mobile originating calls and the establishment cause is *mo-Data* or *mo-ExceptionData* or *delayTolerantAccess*;
 - 1> the establishment or resumption request is suitable for EDT as specified in TS 36.300 [9], clause 7.3b.1;
 - 1> SystemInformationBlockType2 (SystemInformationBlockType2-NB in NB-IoT) includes edt-Parameters;
 - 1> the size of the resulting MAC PDU including the total UL data is expected to be smaller than or equal to the TBS signalled in *edt-TBS* as specified in TS 36.321 [6], clause 5.1.1;
 - 1> EDT fallback indication has not been received from lower layers for this establishment or resumption procedure;
 - NOTE 1: Upper layers request or resume an RRC connection. The interaction with NAS is up to UE implementation.

NOTE 2: It is up to UE implementation how the UE determines whether the size of UL data is suitable for EDT.

5.3.3.2 Initiation

The UE initiates the procedure when upper layers request establishment or resume of an RRC connection while the UE is in RRC_IDLE or when upper layers request resume of an RRC connection or RRC layer requests resume of an RRC connection for, e.g. RNAU or reception of RAN paging while the UE is in RRC_INACTIVE.

Except for NB-IoT, upon initiation of the procedure, if the UE is connected to EPC, the UE shall:

- 1> if SystemInformationBlockType2 includes ac-BarringPerPLMN-List and the ac-BarringPerPLMN-List contains an AC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]):
 - 2> select the AC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers;
 - 2> in the remainder of this procedure, use the selected AC-BarringPerPLMN entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the common access barring parameters included in SystemInformationBlockType2;

1> else

- 2> in the remainder of this procedure use the common access barring parameters (i.e. presence or absence of these parameters) included in *SystemInformationBlockType2*;
- 1> if SystemInformationBlockType2 contains acdc-BarringPerPLMN-List and the acdc-BarringPerPLMN-List contains an ACDC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]):
 - 2> select the ACDC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers;
 - 2> in the remainder of this procedure, use the selected ACDC-BarringPerPLMN entry for ACDC barring check (i.e. presence or absence of access barring parameters in this entry) irrespective of the acdc-BarringForCommon parameters included in SystemInformationBlockType2;

1> else:

- 2> in the remainder of this procedure use the *acdc-BarringForCommon* (i.e. presence or absence of these parameters) included in *SystemInformationBlockType2* for ACDC barring check;
- 1> if upper layers indicate that the RRC connection is subject to EAB (see TS 24.301 [35]):
 - 2> if the result of the EAB check, as specified in 5.3.3.12, is that access to the cell is barred:
 - 3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that EAB is applicable, upon which the procedure ends;
- 1> if upper layers indicate that the RRC connection is subject to ACDC (see TS 24.301 [35]), SystemInformationBlockType2 contains BarringPerACDC-CategoryList, and acdc-HPLMNonly indicates that ACDC is applicable for the UE:
 - 2> if the *BarringPerACDC-CategoryList* contains a *BarringPerACDC-Category* entry corresponding to the ACDC category selected by upper layers:
 - 3> select the BarringPerACDC-Category entry corresponding to the ACDC category selected by upper layers;

2> else:

3> select the last *BarringPerACDC-Category* entry in the *BarringPerACDC-CategoryList*;

2> stop timer T308, if running;

2> perform access barring check as specified in 5.3.3.13, using T308 as "Tbarring" and *acdc-BarringConfig* in the *BarringPerACDC-Category* as "ACDC barring parameter";

- 3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring is applicable due to ACDC, upon which the procedure ends;
- 1> else if the UE is establishing the RRC connection for mobile terminating calls:
 - 2> if timer T302 is running:
 - 3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile terminating calls is applicable, upon which the procedure ends;
- 1> else if the UE is establishing the RRC connection for emergency calls:
 - 2> if *SystemInformationBlockType2* includes the *ac-BarringInfo*:
 - 3> if the *ac-BarringForEmergency* is set to *TRUE*:
 - 4> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11]:
- NOTE 1: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/EHPLMN.
 - 5> if the *ac-BarringInfo* includes *ac-BarringForMO-Data*, and for all of these valid Access Classes for the UE, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ac-BarringForMO-Data* is set to *one*:
 - 6> consider access to the cell as barred;

4> else:

5> consider access to the cell as barred;

- 2> if access to the cell is barred:
 - 3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication, upon which the procedure ends;
- 1> else if the UE is establishing the RRC connection for mobile originating calls:
 - 2> perform access barring check as specified in 5.3.3.11, using T303 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";
 - 2> if access to the cell is barred:
 - 3> if SystemInformationBlockType2 includes ac-BarringForCSFB or the UE does not support CS fallback:
 - 4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls is applicable, upon which the procedure ends;
 - 3> else (SystemInformationBlockType2 does not include ac-BarringForCSFB and the UE supports CS fallback):
 - 4> if timer T306 is not running, start T306 with the timer value of T303;
 - 4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls and mobile originating CS fallback is applicable, upon which the procedure ends;

1> else if the UE is establishing the RRC connection for mobile originating signalling:

^{2&}gt; if access to the cell is barred:

- 2> perform access barring check as specified in 5.3.3.11, using T305 as "Tbarring" and *ac-BarringForMO-Signalling* as "AC barring parameter";
- 2> if access to the cell is barred:
 - 3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating signalling is applicable, upon which the procedure ends;
- 1> else if the UE is establishing the RRC connection for mobile originating CS fallback:
 - 2> if SystemInformationBlockType2 includes ac-BarringForCSFB:
 - 3> perform access barring check as specified in 5.3.3.11, using T306 as "Tbarring" and *ac-BarringForCSFB* as "AC barring parameter";
 - 3> if access to the cell is barred:
 - 4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating CS fallback is applicable, due to *ac-BarringForCSFB*, upon which the procedure ends;

2> else:

- 3> perform access barring check as specified in 5.3.3.11, using T306 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";
- 3> if access to the cell is barred:
 - 4> if timer T303 is not running, start T303 with the timer value of T306;
 - 4> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating CS fallback and mobile originating calls is applicable, due to *ac-BarringForMO-Data*, upon which the procedure ends;
- 1> else if the UE is establishing the RRC connection for mobile originating MMTEL voice, mobile originating MMTEL video, mobile originating SMSoIP or mobile originating SMS:
 - 2> if the UE is establishing the RRC connection for mobile originating MMTEL voice and SystemInformationBlockType2 includes ac-BarringSkipForMMTELVoice; or
 - 2> if the UE is establishing the RRC connection for mobile originating MMTEL video and SystemInformationBlockType2 includes ac-BarringSkipForMMTELVideo; or
 - 2> if the UE is establishing the RRC connection for mobile originating SMSoIP or SMS and *SystemInformationBlockType2* includes *ac-BarringSkipForSMS*:
 - 3> consider access to the cell as not barred;

2> else:

- 3> if *establishmentCause* received from higher layers is set to *mo-Signalling* (including the case that *mo-Signalling* is replaced by *highPriorityAccess* according to TS 24.301 [35] or by *mo-VoiceCall* according to the clause 5.3.3.3):
 - 4> perform access barring check as specified in 5.3.3.11, using T305 as "Tbarring" and *ac-BarringForMO-Signalling* as "AC barring parameter";
 - 4> if access to the cell is barred:
 - 5> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating signalling is applicable, upon which the procedure ends;
- 3> if *establishmentCause* received from higher layers is set to *mo-Data* (including the case that *mo-Data* is replaced by *highPriorityAccess* according to TS 24.301 [35] or by *mo-VoiceCall* according to the clause 5.3.3.3):

- 4> perform access barring check as specified in 5.3.3.11, using T303 as "Tbarring" and *ac-BarringForMO-Data* as "AC barring parameter";
- 4> if access to the cell is barred:
 - 5> if SystemInformationBlockType2 includes ac-BarringForCSFB or the UE does not support CS fallback:
 - 6> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls is applicable, upon which the procedure ends;
 - 5> else (*SystemInformationBlockType2* does not include *ac-BarringForCSFB* and the UE supports CS fallback):
 - 6> if timer T306 is not running, start T306 with the timer value of T303;
 - 6> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls and mobile originating CS fallback is applicable, upon which the procedure ends;

Upon initiation of the procedure, if the UE is connected to 5GC, the UE shall:

- 1> if the upper layers provide an Access Category and one or more Access Identities upon requesting establishment of an RRC connection:
 - 2> perform the unified access control procedure as specified in 5.3.16 using the Access Category and Access Identities provided by upper layers;

3> if the access attempt is barred, the procedure ends;

1> if the resumption of the RRC connection is triggered by response to NG-RAN paging:

- 2> select '0' as the Access Category;
- 2> perform the unified access control procedure as specified in 5.3.16 using the selected Access Category and one or more Access Identities provided by upper layers;
 - 3> if the access attempt is barred, the procedure ends;
- 1> else if the resumption of the RRC connection is triggered by upper layers:
 - 2> if the upper layers provide an Access Category and one or more Access Identities:
 - 3> perform the unified access control procedure as specified in 5.3.16 using the Access Category and Access Identities provided by upper layers;
 - 4> if the access attempt is barred, the procedure ends;
 - 2> set the *resumeCause* in accordance with the information received from upper layers;

1> else if the resumption of the RRC connection is triggered due to an RNAU:

- 2> if an emergency service is ongoing:
 - 3> select '2' as the Access Category;
 - 3> set the *resumeCause* to *emergency*;
- 2> else:

3> select '8' as the Access Category;

2> perform the unified access control procedure as specified in 5.3.16 using the selected Access Category and one or more Access Identities to be applied as specified in TS 24.501 [95];

3> if the access attempt is barred:

- 4> set the variable *pendingRnaUpdate* to 'TRUE';
- 4> the procedure ends;

Except for NB-IoT, upon initiating the procedure, if connected to EPC or 5GC, the UE shall:

- 1> if the UE is resuming an RRC connection from a suspended RRC connection or from RRC_INACTIVE:
 - 2> if the UE was configured with (NG)EN-DC:

3> perform MR-DC release, as specified in TS 38.331 [82], clause 5.3.5.10;

- 2> release the MCG SCell(s), if configured, in accordance with 5.3.10.3a;
- 2> release powerPrefIndicationConfig, if configured and stop timer T340, if running;
- 2> release reportProximityConfig and clear any associated proximity status reporting timer;
- 2> release *obtainLocationConfig*, if configured;
- 2> release *idc-Config*, if configured;
- 2> release *sps-AssistanceInfoReport*, if configured;
- 2> release measSubframePatternPCell, if configured;
- 2> release the entire SCG configuration, if configured, except for the DRB configuration (as configured by *drb-ToAddModListSCG*);
- 2> release *naics-Info* for the PCell, if configured;
- 2> release the LWA configuration, if configured, as described in 5.6.14.3;
- 2> release the LWIP configuration, if configured, as described in 5.6.17.3;
- 2> release *bw-PreferenceIndicationTimer*, if configured and stop timer T341, if running;
- 2> release *delayBudgetReportingConfig*, if configured and stop timer T342, if running;
- 2> release *ailc-BitConfig*, if configured;
- 2> release uplinkDataCompression, if configured;
- NOTE 1a: The parameters and configurations are released from the UE Inactive AS context if the UE is resuming an RRC connection from RRC_INACTIVE.
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> apply the CCCH configuration as specified in 9.1.1.2;
- 1> apply the *timeAlignmentTimerCommon* included in *SystemInformationBlockType2*;
- 1> start timer T300;
- 1> if the UE is resuming an RRC connection from a suspended RRC connection:

2> initiate transmission of the RRCConnectionResumeRequest message in accordance with 5.3.3.3a;

1> else if the UE is resuming an RRC connection from RRC_INACTIVE:

2> set the variable *pendingRnaUpdate* to 'FALSE';

2> initiate transmission of the RRCConnectionResumeRequest message in accordance with 5.3.3.3a;

1> else:

- 2> if stored, discard the UE AS context and *resumeIdentity*;
- 2> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b:

3> initiate transmission of the RRCEarlyDataRequest message in accordance with 5.3.3.3b;

- 2> else:
 - 3> initiate transmission of the *RRCConnectionRequest* message in accordance with 5.3.3.3;
- NOTE 2: Upon initiating the connection establishment procedure, the UE is not required to ensure it maintains up to date system information applicable only for UEs in RRC_IDLE state or UEs in RRC_INACTIVE. However, the UE needs to perform system information acquisition upon cell re-selection.

For NB-IoT, upon initiation of the procedure, the UE shall:

- 1> if the UE is establishing or resuming the RRC connection for mobile originating exception data; or
- 1> if the UE is establishing or resuming the RRC connection for mobile originating data; or
- 1> if the UE is establishing or resuming the RRC connection for delay tolerant access; or
- 1> if the UE is establishing or resuming the RRC connection for mobile originating signalling;
 - 2> perform access barring check as specified in 5.3.3.14;
 - 2> if access to the cell is barred:
 - 3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication and that access barring is applicable, upon which the procedure ends;
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> apply the CCCH configuration as specified in 9.1.1.2;
- 1> start timer T300;
- 1> if the UE is establishing an RRC connection:
 - 2> if stored, discard the UE AS context and *resumeIdentity*;
 - 2> if the UE is initiating CP-EDT in accordance with conditions in 5.3.3.1b:
 - 3> initiate transmission of the RRCEarlyDataRequest message in accordance with 5.3.3.3b;
 - 2> else:
 - 3> initiate transmission of the *RRCConnectionRequest* message in accordance with 5.3.3.3;
- 1> else if the UE is resuming an RRC connection:
 - 2> release *schedulingRequestConfig*, if configured;
 - 2> initiate transmission of the RRCConnectionResumeRequest message in accordance with 5.3.3.3a;
- NOTE 3: Upon initiating the connection establishment or resumption procedure, the UE is not required to ensure it maintains up to date system information applicable only for UEs in RRC_IDLE state. However, the UE needs to perform system information acquisition upon cell re-selection.
- NOTE 4: For EDT, upon initiating the connection establishment or resumption procedure, it is up to UE implementation whether to continue cell re-selection related measurements as well as cell re-selection evaluation and, if the conditions for cell re-selection are fulfilled, whether to perform cell re-selection as specified in 5.3.3.5.

5.3.3.3 Actions related to transmission of *RRCConnectionRequest* message

The UE shall set the contents of RRCConnectionRequest message as follows:

- 1> if the UE is connected to EPC:
 - 2> set the *ue-Identity* as follows:
 - 3> if upper layers provide an S-TMSI:
 - 4> set the *ue-Identity* to the value received from upper layers;
 - 3> else:
 - 4 > draw a random value in the range 0 .. 2^{40} -1 and set the *ue-Identity* to this value;
- NOTE 1: Upper layers provide the S-TMSI if the UE is registered in the TA of the current cell.
 - 2> if the UE supports *mo-VoiceCall* establishment cause and UE is establishing the RRC connection for mobile originating MMTEL voice and *SystemInformationBlockType2* includes *voiceServiceCauseIndication* and the establishment cause received from upper layers is not set to *highPriorityAccess*:

3> set the establishmentCause to mo-VoiceCall;

2> else if the UE supports mo-VoiceCall establishment cause for mobile originating MMTEL video and UE is establishing the RRC connection for mobile originating MMTEL video and SystemInformationBlockType2 includes videoServiceCauseIndication and the establishment cause received from upper layers is not set to highPriorityAccess:

3> set the establishmentCause to mo-VoiceCall;

2> else:

3> set the *establishmentCause* in accordance with the information received from upper layers;

- 1> if the UE is connected to 5GC:
 - 2> set the *ue-Identity* as follows:
 - 3> if upper layers provide a 5G-S-TMSI:
 - 4> set the *ue-Identity* to ng-5G-S-TMSI-Part1;
 - 3> else:
 - 4 > draw a random value in the range 0 .. 2^{40} -1 and set the *ue-Identity* to this value;
 - 2> set the *establishmentCause* in accordance with the information received from upper layers;

2> apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1.1 for SRB1;

2> use NR PDCP for all subsequent messages received and sent by the UE via SRB1;

1> if the UE is a NB-IoT UE:

- 2> if the UE supports multi-tone transmission, include *multiToneSupport*;
- 2> if the UE supports multi-carrier operation, include *multiCarrierSupport*;
- 2> if the UE supports DL channel quality reporting and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:
 - 3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the serving cell as specified in TS 36.133 [16];
- NOTE 2: The downlink channel quality measurements may use measurement period T1 or T2, as defined in TS 36.133 [16]. In case period T2 is used the RRC-MAC interactions are left to UE implementation.

2> set *earlyContentionResolution* to TRUE;

The UE shall submit the RRCConnectionRequest message to lower layers for transmission.

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation. If the conditions for cell re-selection are fulfilled, the UE shall perform cell re-selection as specified in 5.3.3.5.

5.3.3.3. Actions related to transmission of *RRCConnectionResumeRequest* message

If the UE is resuming the RRC connection from a suspended RRC connection, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:

- 1> if the UE is a NB-IoT UE; or
- 1> if the UE is initiating UP-EDT in accordance with conditions in 5.3.3.1b; or
- 1> if field useFullResumeID is signalled in SystemInformationBlockType2:

2> set the *resumeID* to the stored *resumeIdentity*;

1> else:

- 2> set the *truncatedResumeID* to include bits in bit position 9 to 20 and 29 to 40 from the left in the stored *resumeIdentity*.
- 1> if the UE supports *mo-VoiceCall* establishment cause and UE is resuming the RRC connection for mobile originating MMTEL voice and *SystemInformationBlockType2* includes *voiceServiceCauseIndication* and the establishment cause received from upper layers is not set to *highPriorityAccess*:

2> set the *resumeCause* to *mo-VoiceCall*;

1> else if the UE supports mo-VoiceCall establishment cause for mobile originating MMTEL video and UE is resuming the RRC connection for mobile originating MMTEL video and SystemInformationBlockType2 includes videoServiceCauseIndication and the establishment cause received from upper layers is not set to highPriorityAccess:

2> set the *resumeCause* to *mo-VoiceCall*;

1> else:

2> set the *resumeCause* in accordance with the information received from upper layers;

- 1> set the *shortResumeMAC-I* to the 16 least significant bits of the MAC-I calculated:
 - 2> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) VarShortResumeMAC-Input (or VarShortResumeMAC-Input-NB in NB-IoT);
 - 2> with the K_{RRCint} key and the previously configured integrity protection algorithm; and

2> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;

1> if the UE is a NB-IoT UE:

- 2> if the UE supports DL channel quality reporting and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:
 - 3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the serving cell as specified in TS 36.133 [16];
- NOTE 0: The downlink channel quality measurements may use measurement period T1 or T2, as defined in TS 36.133 [16]. In case period T2 is used the RRC-MAC interactions are left to UE implementation.
 - 2> set *earlyContentionResolution* to TRUE;
- 1> restore the RRC configuration and security context from the stored UE AS context;
- 1> if the UE is initiating UP-EDT in accordance with conditions in 5.3.3.1b:

- 2> restore the PDCP state and re-establish PDCP entities for all SRBs and all DRBs;
- 2> if *drb-ContinueROHC* has been provided in immediately preceding RRC connection release message, and the UE is requesting to resume RRC connection in the same cell:
 - 3> indicate to lower layers that stored UE AS context is used and that *drb-ContinueROHC* is configured;
 - 3> continue the header compression protocol context for the DRBs configured with the header compression protocol;

2> else:

- 3> indicate to lower layers that stored UE AS context is used;
- 3> reset the header compression protocol context for the DRBs configured with the header compression protocol;
- 2> resume all SRBs and all DRBs;
- 2> derive the K_{eNB} key based on the K_{ASME} key to which the current K_{eNB} is associated, using the stored value of *nextHopChainingCount* received in the *RRCConnectionRelease* message in the preceding connection, as specified in TS 33.401 [32];
- 2> derive the K_{RRCint} key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];
- 2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the previously configured ciphering algorithm, as specified in TS 33.401 [32];
- 2> configure lower layers to resume integrity protection using the previously configured algorithm and the K_{RRCint} key derived in this clause to all subsequent messages received and sent by the UE;
- 2> configure lower layers to resume ciphering and to apply the ciphering algorithm and the K_{RRCenc} key derived in this clause to all subsequent messages received and sent by the UE;
- 2> configure lower layers to resume ciphering and to apply the ciphering algorithm and the K_{UPenc} key derived in this clause immediately to the user data sent and received by the UE;

2> configure the lower layers to use EDT;

1> else:

- 2> if SRB1 was configured with NR PDCP:
 - 3> for SRB1, release the NR PDCP entity and establish an E-UTRA PDCP entity with the current (MCG) security configuration;
- NOTE 1: The UE applies the LTE ciphering and integrity protection algorithms that are equivalent to the previously configured NR security algorithms.

2> else:

3> for SRB1, restore the PDCP state and re-establish the PDCP entity;

If the UE is resuming the RRC connection from RRC_INACTIVE, the UE shall set the contents of *RRCConnectionResumeRequest* message as follows:

2> if field useFullResumeID is signalled in SystemInformationBlockType2:

3> set the *fullI-RNTI* to the stored *fullI-RNTI* value provided in suspend;

2> else:

3> set the *shortI-RNTI* to the stored *shortI-RNTI* value provided in suspend;

2> restore the RRC configuration and the K_{eNB} and K_{RRCint} keys from the UE Inactive AS context except physical layer, MAC configuration and NR *pdcp-Config*;

- 2> set the *shortResumeMAC-I* to the 16 least significant bits of the MAC-I calculated:
 - 3> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) VarShortINACTIVE-MAC-Input;
 - 3> with the K_{RRCint} key in the UE Inactive AS Context and the previously configured integrity protection algorithm; and
 - 3> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;
- 2> derive the K_{eNB} key based on the current K_{eNB} or the NH, using the stored *nextHopChainingCount* value, as specified in TS 33.501 [86];
- 2> derive the K_{RRCenc} key, the K_{RRCint} and the K_{UPenc} key, as specified in TS 33.401 [32];
- 2> apply the default configuration for SRB1 as specified in 9.2.1.1;
- 2> apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1 for SRB1;
- 2> configure lower layers to resume integrity protection for all SRBs except SRB0 using the configured algorithm and the K_{RRCint} key derived in this clause immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE;
- 2> configure lower layers to resume ciphering for all radio bearers except SRB0 and to apply the configured ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key derived in this clause, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE;

Following procedures are applied for both suspended RRC connection and RRC_INACTIVE:

- 2> resume SRB1;
- NOTE 2: Until successful connection resumption, the default physical layer configuration and the default MAC Main configuration are applied for the transmission of SRB0 and SRB1, and SRB1 is used only for the transfer of *RRCConnectionResume* message.

The UE shall submit the RRCConnectionResumeRequest message to lower layers for transmission.

The UE shall continue cell re-selection related measurements as well as cell re-selection evaluation.

If the UE is resuming the RRC connection from RRC_INACTIVE and if lower layers indicate an integrity check failure while T300 is running, the UE shall perform actions specified in 5.3.3.16.

5.3.3.3b Actions related to transmission of *RRCEarlyDataRequest* message

The UE shall set the contents of RRCEarlyDataRequest message as follows:

- 1> set the *s*-*TMSI* to the value received from upper layers;
- 1> set the *establishmentCause* in accordance with the information received from upper layers;
- 1> if the UE is a NB-IoT UE:
 - 2> if the UE supports DL channel quality reporting and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:
 - 3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the serving cell as specified in TS 36.133 [16];
- NOTE: The downlink channel quality measurements may use measurement period T1 or T2, as defined in TS 36.133 [16]. In case period T2 is used the RRC-MAC interactions are left to UE implementation.
- 1> set the *dedicatedInfoNAS* to include the information received from upper layers;

The UE shall configure the lower layers to use EDT and submit the *RRCEarlyDataRequest* message to the lower layers for transmission.

5.3.3.3. UE actions upon receiving EDT fallback indication from lower layers

Upon indication from lower layers that EDT is cancelled, the UE shall:

- 1> start or restart timer T300;
- 1> if the fallback is indicated by lower layers in response to the *RRCEarlyDataRequest*:
 - 2> initiate transmission of *RRCConnectionRequest* message in accordance with 5.3.3.3;
- 1> else if the fallback is indicated by lower layers in response to the *RRCConnectionResumeRequest* for EDT and the fallback is not due to the UL grant provided in Random Access Response not being for EDT:
 - 2> perform the actions upon abortion of UP-EDT as specified in 5.3.3.9a;
 - 2> initiate transmission of the RRCConnectionResumeRequest message in accordance with 5.3.3.3a;
- NOTE: It is up to UE implementation to avoid data loss due to EDT fallback.

5.3.3.4 Reception of the *RRCConnectionSetup* by the UE

NOTE 1: Prior to this, lower layer signalling is used to allocate a C-RNTI. For further details see TS 36.321 [6];

The UE shall:

- 1> if the RRCConnectionSetup is received in response to an RRCConnectionResumeRequest from a suspended RRC connection:
 - 2> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established or suspended RBs, except for SRB0;
 - 2> discard the stored UE AS context and *resumeIdentity*;
 - 2> if stored, discard the stored *nextHopChainingCount*;
 - 2> if stored, discard the stored *drb-ContinueROHC*;
 - 2> indicate to upper layers fallback of the RRC connection;
- 1> if the RRCConnectionSetup is received in response to an RRCConnectionResumeRequest from RRC_INACTIVE:
 - 2> stop T380 if running;
 - 2> discard the stored UE Inactive AS context;
 - 2> discard any current AS security context including the K_{RRCenc} key, the K_{RRCint} key, the K_{UPint} key and the K_{UPenc} key;
 - 2> release radio resources for all established RBs except SRB0, including release of the RLC entities, of the associated PDCP entities and of SDAP entities;
 - 2> release the RRC configuration except for the default L1 parameter values, default MAC main configuration and CCCH;
 - 2> apply the default NR PDCP configuration as specified in TS 38.331 [82], clause 9.2.1.1 for SRB1;
 - 2> use NR PDCP for all subsequent messages received and sent by the UE via SRB1;
 - 2> indicate to upper layers fallback of the RRC connection;
- 1> perform the radio resource configuration procedure in accordance with the received *radioResourceConfigDedicated* and as specified in 5.3.10;
- 1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;

- 1> if stored, discard the dedicated offset provided by the *redirectedCarrierOffsetDedicated*;
- 1> stop timer T300;
- 1> if T302 is running:
 - 2> stop timer T302;
 - 2> if the UE is connected to 5GC:
 - 3> perform the actions as specified in 5.3.16.4;
- 1> stop timer T303, if running;
- 1> stop timer T305, if running;
- 1> stop timer T306, if running;
- 1> stop timer T308, if running;
- 1> perform the actions as specified in 5.3.3.7;
- 1> stop timer T320, if running;
- 1> stop timer T350, if running;
- 1> perform the actions as specified in 5.6.12.4;
- 1> release *rclwi-Configuration*, if configured, as specified in 5.6.16.2;
- 1> stop timer T360, if running;
- 1> stop timer T322, if running;
- 1> if T309 is running:
 - 2> stop timer T309 for all access categories;
 - 2> perform the actions as specified in 5.3.16.4.
- 1> enter RRC_CONNECTED;
- 1> stop the cell re-selection procedure;
- 1> consider the current cell to be the PCell;
- 1> set the content of *RRCConnectionSetupComplete* message as follows:
 - 2> if the RRCConnectionSetup is received in response to an RRCConnectionResumeRequest:
 - 3> if upper layers provide an S-TMSI:
 - 4> set the *s*-*TMSI* to the value received from upper layers;
 - 3> else if upper layers provide a 5G-S-TMSI:
 - 4> set the ng-5G-S-TMSI-Bits to ng-5G-S-TMSI with the value received from upper layers;
 - 2> else if upper layers provide a 5G-S-TMSI:
 - 3> set the *ng-5G-S-TMSI-Bits* to *ng-5G-S-TMSI-Part2* to the leftmost 8 bits of 5G-S-TMSI received from upper layers;
 - 2> set the selectedPLMN-Identity to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35] for E-UTRA/EPC and TS 24.501 [95] for E-UTRA/5GC) from the PLMN(s) included in the plmn-IdentityList in SystemInformationBlockType1 (or SystemInformationBlockType1-NB in NB-IoT);
 - 2> if upper layers provide the 'Registered MME', include and set the *registeredMME* as follows:

- 3> if the PLMN identity of the 'Registered MME' is different from the PLMN selected by the upper layers:
 - 4> include the *plmnIdentity* in the *registeredMME* and set it to the value of the PLMN identity in the 'Registered MME' received from upper layers;
- 3> set the *mmegi* and the *mmec* to the value received from upper layers;
- 2> if upper layers provided the 'Registered MME':
 - 3> include and set the *gummei-Type* to the value provided by the upper layers;
- 2> if upper layers provide the 'Registered AMF', include and set the *registeredAMF* as follows:
 - 3> if the PLMN identity of the 'Registered AMF' is different from the PLMN selected by the upper layers:
 - 4> include the *plmnIdentity* in the *registeredAMF* and set it to the value of the PLMN identity in the 'Registered AMF' received from upper layers;
 - 3> set the amf-Identifier to AMF Identifier of the 'Registered AMF' received from upper layers;
- 2> if upper layers provided the 'Registered AMF':

3> include and set the *guami-Type* to the value provided by the upper layers;

- 2> if upper layers provide one or more S-NSSAI (see TS 23.003 [27]):
 - 3> include the *s*-NSSAI-list and set the content to the values provided by the upper layers;
- 2> if the UE supports CIoT EPS optimisation(s):

3> include attachWithoutPDN-Connectivity if received from upper layers;

- 3> include up-CIoT-EPS-Optimisation if received from upper layers;
- 3> except for NB-IoT, include cp-CloT-EPS-Optimisation if received from upper layers;
- 2> if connecting as an RN:

3> include the *rn-SubframeConfigReq*;

2> if the *RRCConnectionSetup* is received in response to *RRCEarlyDataRequest*:

3> set the *dedicatedInfoNAS* to a zero-length octet string;

2> else:

3> set the *dedicatedInfoNAS* to include the information received from upper layers;

- 2> if the UE is connected to EPC:
 - 3> except for NB-IoT:
 - 4> if the UE has radio link failure or handover failure information available in VarRLF-Report and if the RPLMN is included in plmn-IdentityList stored in VarRLF-Report:

5> include *rlf-InfoAvailable*;

4> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailableMBSFN*;

4> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailable*;

4> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailableBT*;

4> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

5> include *logMeasAvailableWLAN*;

4> if the UE has connection establishment failure information available in VarConnEstFailReport and if the RPLMN is equal to plmn-Identity stored in VarConnEstFailReport:

5> include *connEstFailInfoAvailable*;

- 4> include the *mobilityState* and set it to the mobility state (as specified in TS 36.304 [4]) of the UE just prior to entering RRC_CONNECTED state;
- 4> stop T331, if running;
- 4> if the UE has flight path information available:

5> include *flightPathInfoAvailable*;

- 3> for NB-IoT:
 - 4> if the UE supports serving cell idle mode measurements reporting and *servingCellMeasInfo* is present in *SystemInformationBlockType2-NB*:

5> set the *measResultServCell* to include the measurements of the serving cell;

- NOTE 2: The UE includes the latest results of the serving cell measurements as used for cell selection/ reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
 - 3> include *dcn-ID* if a DCN-ID value (see TS 23.401 [41]) is received from upper layers;
 - 2> except for NB-IoT:
 - 3> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

4> include the *mobilityHistoryAvail*;

- 3> if the SIB2 contains *idleModeMeasurements*, and the UE has IDLE mode measurement information available in *VarMeasIdleReport*:
 - 4> include the *idleMeasAvailable*;
- 2> if UE needs UL gaps during continuous uplink transmission:

3> include *ue-CE-NeedULGaps*;

- 1> submit the *RRCConnectionSetupComplete* message to lower layers for transmission;
- 1> the procedure ends.

5.3.3.4a Reception of the *RRCConnectionResume* by the UE

The UE shall:

- 1> stop timer T300;
- 1> if T309 is running:
 - 2> stop timer T309 for all access categories;

2> perform the actions as specified in 5.3.16.4.

- 1> stop T380 if running;
- 1> except if the *RRCConnectionResume* is received in response to an *RRCConnectionResumeRequest* for EDT:
 - 2> if resuming an RRC connection from a suspended RRC connection:
 - 3> restore the PDCP state and re-establish PDCP entities for SRB2, if configured with E-UTRA PDCP, and for all DRBs that are configured with E-UTRA PDCP;
 - 3> if drb-ContinueROHC is included:
 - 4> indicate to lower layers that stored UE AS context is used and that *drb-ContinueROHC* is configured;
 - 4> continue the header compression protocol context for the DRBs configured with the header compression protocol;
 - 3> else:
 - 4> indicate to lower layers that stored UE AS context is used;
 - 4> reset the header compression protocol context for the DRBs configured with the header compression protocol;
 - 3> discard the stored UE AS context and *resumeIdentity*;
 - 2> else if the *RRCConnectionResume* message includes the *fullConfig* (for resuming an RRC connection from RRC_INACTIVE):
 - 3> perform the radio configuration procedure as specified in 5.3.5.8;
 - 2> else (for resuming an RRC connection from RRC_INACTIVE):
 - 3> restore the physical layer configuration, the MAC configuration, the RLC configuration and the PDCP configuration from the stored UE Inactive AS context;
 - 3> discard the stored UE Inactive AS context;
 - 3> release the *rrc-InactiveConfig*, except *ran-NotificationAreaInfo*;

1> else:

2> discard the stored UE AS context and *resumeIdentity*;

- 1> perform the radio resource configuration procedure in accordance with the received radioResourceConfigDedicated and as specified in 5.3.10;
- NOTE 1: When performing the radio resource configuration procedure, for the physical layer configuration and the MAC Main configuration, the restored RRC configuration from the stored UE AS context is used as basis for the reconfiguration.
- 1> if the received *RRCConnectionResume* message includes the *sk-Counter*:

2> perform key update procedure as specified in TS 38.331 [82], clause 5.3.5.8;

1> if the received *RRCConnectionResume* message includes the *nr-RadioBearerConfig1*:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> if the received RRCConnectionResume message includes the nr-RadioBearerConfig2:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> except if the *RRCConnectionResume* is received in response to an *RRCConnectionResumeRequest* for EDT:

2> resume SRB2 and all DRBs, if any, including RBs configured with NR PDCP;

- 1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;
- 1> if stored, discard the dedicated offset provided by the *redirectedCarrierOffsetDedicated*;
- 1> if the *RRCConnectionResume* message includes the *measConfig*:
 - 2> perform the measurement configuration procedure as specified in 5.5.2;
- 1> if T302 is running:
 - 2> stop timer T302;
 - 2> if the UE is connected to 5GC:

3> perform the actions as specified in 5.3.16.4;

- 1> stop timer T303, if running;
- 1> stop timer T305, if running;
- 1> stop timer T306, if running;
- 1> stop timer T308, if running;
- 1> perform the actions as specified in 5.3.3.7;
- 1> stop timer T320, if running;
- 1> stop timer T350, if running;
- 1> perform the actions as specified in 5.6.12.4;
- 1> stop timer T360, if running;
- 1> stop timer T322, if running;
- 1> if the RRCConnectionResume is received in response to an RRCConnectionResumeRequest for EDT or an RRCConnectionResumeRequest from RRC_INACTIVE:

2> ignore the *nextHopChainingCount* value indicated in the *RRCConnectionResume* message;

```
1> else:
```

- 2> if resuming an RRC connection from a suspended RRC connection:
 - 3> update the K_{eNB} key based on the K_{ASME} key to which the current K_{eNB} is associated, using the *nextHopChainingCount* value indicated in the *RRCConnectionResume* message, as specified in TS 33.401 [32];
 - 3> store the *nextHopChainingCount* value;
 - 3> derive the K_{RRCint} key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];
 - 3> request lower layers to verify the integrity protection of the *RRCConnectionResume* message, using the previously configured algorithm and the K_{RRCint} key;
 - 3> if the integrity protection check of the *RRCConnectionResume* message fails:
 - 4> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other', upon which the procedure ends;
 - 3> derive the K_{RRCenc} key and the K_{UPenc} key associated with the previously configured ciphering algorithm, as specified in TS 33.401 [32];

- 3> configure lower layers to resume integrity protection using the previously configured algorithm and the K_{RRCint} key immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE;
- 3> configure lower layers to resume ciphering and to apply the ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE;
- 1> enter RRC_CONNECTED;
- 1> indicate to upper layers that the suspended RRC connection has been resumed;
- 1> stop the cell re-selection procedure;
- 1> consider the current cell to be the PCell;
- 1> set the content of *RRCConnectionResumeComplete* message as follows:
 - 2> set the selectedPLMN-Identity to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35] for E-UTRA/EPC and TS 24.501 [95] for E-UTRA/5GC) from the PLMN(s) included in the plmn-IdentityList in SystemInformationBlockType1;
 - 2> set the *dedicatedInfoNAS* to include the information received from upper layers;
 - 2> except for NB-IoT:
 - 3> if resuming an RRC connection from a suspended RRC connection:
 - 4> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 5> include rlf-InfoAvailable;
 - 4> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 5> include logMeasAvailableMBSFN;
 - 4> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 5> include logMeasAvailable;
 - 4> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 5> include logMeasAvailableBT;
 - 4> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:
 - 5> include logMeasAvailableWLAN;
 - 4> if the UE has connection establishment failure information available in VarConnEstFailReport and if the RPLMN is equal to plmn-Identity stored in VarConnEstFailReport:
 - 5> include connEstFailInfoAvailable;
 - 4> include the *mobilityState* and set it to the mobility state (as specified in TS 36.304 [4]) of the UE just prior to entering RRC_CONNECTED state;
 - 4> stop T331, if running;
 - 4> if the UE has flight path information available:
 - 5> include *flightPathInfoAvailable*;

3> if the UE supports storage of mobility history information and the UE has mobility history information available in *VarMobilityHistoryReport*:

4> include *mobilityHistoryAvail*;

3> if the SIB2 contains *idleModeMeasurements*, and the UE has IDLE mode measurement information available in *VarMeasIdleReport*:

4> include the *idleMeasAvailable*;

- 2> for NB-IoT:
 - 3> if the UE supports serving cell idle mode measurements reporting and *servingCellMeasInfo* is present in *SystemInformationBlockType2-NB*:

4> set the *measResultServCell* to include the measurements of the serving cell;

NOTE 2: The UE includes the latest results of the serving cell measurements as used for cell selection/ reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].

1> submit the *RRCConnectionResumeComplete* message to lower layers for transmission;

1> the procedure ends.

5.3.3.4b Reception of the *RRCEarlyDataComplete* by the UE

The UE shall:

- 1> indicate to upper layers that the RRC connection has been established;
- 1> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;
- 1> if stored, discard the dedicated offset provided by the redirectedCarrierOffsetDedicated;
- 1> stop timer T300;
- 1> stop timer T302, if running;
- 1> stop timer T303, if running;
- 1> stop timer T305, if running;
- 1> stop timer T306, if running;
- 1> stop timer T308, if running;
- 1> perform the actions as specified in 5.3.3.7;
- 1> stop timer T320, if running;
- 1> stop timer T322, if running;
- 1> forward the *dedicatedInfoNAS*, if received, to the upper layers;
- 1> reset MAC and release the MAC configuration;
- 1> if the RRCEarlyDataComplete message includes redirectedCarrierInfo indicating redirection to geran; and
- 1> if upper layers indicate that redirect to GERAN without AS security is not allowed:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other', upon which the procedure ends;
- 1> if the *RRCEarlyDataComplete* message includes *idleModeMobilityControlInfo*:

2> store the cell reselection priority information provided by the *idleModeMobilityControlInfo*;

2> if the *t320* is included:

3> start timer T320, with the timer value set according to the value of t320;

1> else:

2> apply the cell reselection priority information broadcast in the system information;

1> for NB-IoT, if the *RRCEarlyDataComplete* message includes *redirectedCarrierInfo*:

2> if the *redirectedCarrierOffsetDedicated* is included in the *redirectedCarrierInfo*:

3> store the dedicated offset for the frequency in *redirectedCarrierInfo*;

- 3> start timer T322, with the timer value set according to the value of T322 in redirectedCarrierInfo;
- 1> if the extendedWaitTime is present; and
- 1> if the UE supports delay tolerant access or the UE is a NB-IoT UE:

2> forward the *extendedWaitTime* to upper layers;

1> indicate the release of the RRC connection to upper layers together with the release cause 'other', upon which the procedure ends;

5.3.3.5 Cell re-selection or cell selection while T300, T302, T303, T305, T306, T308 or T309 is running

The UE shall:

- 1> if cell selection or reselection occurs while T309 or T302 is running and if the UE is connected to 5GC:
 - 2> stop timer T309 for all access categories, if running;
 - 2> if in RRC_INACTIVE and T302 is running:
 - 3> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12 with release cause 'RRC Resume failure';

2> else:

- 3> stop timer T302, if running;
- 3> perform the actions as specified in 5.3.16.4;
- 1> if in RRC_INACTIVE:
 - 2> if cell reselection occurs while T300 is running:
 - 3> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12 with release cause 'RRC Resume failure';
- 1> else if cell reselection occurs while T300, T302, T303, T305, T306, or T308 is running:
 - 2> if timer T302, T303, T305, T306, and/or T308 is running and if the UE is connected to EPC:
 - 3> stop timer T302, T303, T305, T306, and T308, whichever ones were running;
 - 3> perform the actions as specified in 5.3.3.7;
 - 2> if timer T300 is running:
 - 3> stop timer T300;

3> if UE has sent RRCConnectionResumeRequest message and has not received RRCConnectionResume message:

4> reset MAC;

4> if UE has initiated UP-EDT:

5> perform the actions upon abortion of UP-EDT as specified in 5.3.3.9a;

4> else:

5> re-establish RLC for all RBs that are established;

5> suspend SRB1;

3> else:

4> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;

3> inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication;

5.3.3.6 T300 expiry

The UE shall:

- 1> if timer T300 expires:
 - 2> if UE has sent RRCConnectionResumeRequest message and has not received RRCConnectionResume message:
 - 3> reset MAC;
 - 3> if UE has initiated UP-EDT:

4> perform the actions upon abortion of UP-EDT as specified in 5.3.3.9a;

- 3> else:
 - 4> re-establish RLC for all RBs that are established;
 - 4> suspend SRB1;

2> else:

3> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;

- 2> if the UE is a NB-IoT UE:
 - 3> if *connEstFailOffset* is included in *SystemInformationBlockType2-NB*:
 - 4> use *connEstFailOffset* for the parameter Qoffset_{temp} for the concerned cell when performing cell selection and reselection according to TS 36.304 [4];

3> else:

- 4> use value of infinity for the parameter Qoffsettemp for the concerned cell when performing cell selection and reselection according to TS 36.304 [4];
- NOTE 0: For NB-IoT, the number of times that the UE detects T300 expiry on the same cell before applying connEstFailOffset and the amount of time that the UE applies connEstFailOffset before removing the offset from evaluation of the cell is up to UE implementation.
 - 2> else if the UE supports RRC Connection Establishment failure temporary Qoffset and T300 has expired a consecutive *connEstFailCount* times on the same cell for which *txFailParams* is included in *SystemInformationBlockType2*:

- 3> for a period as indicated by *connEstFailOffsetValidity*:
 - 4> use *connEstFailOffset* for the parameter Qoffset_{temp} for the concerned cell when performing cell selection and reselection according to TS 36.304 [4] and TS 25.304 [40];
- NOTE 1: When performing cell selection, if no suitable or acceptable cell can be found, it is up to UE implementation whether to stop using *connEstFailOffset* for the parameter Qoffset_{temp} during *connEstFailOffsetValidity* for the concerned cell.
 - 2> except for NB-IoT, store the following connection establishment failure information in the VarConnEstFailReport by setting its fields as follows:
 - 3> clear the information included in *VarConnEstFailReport*, if any;
 - 3> set the *plmn-Identity* to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]) from the PLMN(s) included in the *plmn-IdentityList* in *SystemInformationBlockType1*;
 - 3> set the *failedCellId* to the global cell identity of the cell where connection establishment failure is detected;
 - 3> set the *measResultFailedCell* to include the RSRP and RSRQ, if available, of the cell where connection establishment failure is detected and based on measurements collected up to the moment the UE detected the failure;
 - 3> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies (GERAN) per RAT and according to the following:

4> for each neighbour cell included, include the optional fields that are available;

- NOTE 2: The UE includes the latest results of the available measurements as used for cell reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
 - 3> if available, set the *logMeasResultListWLAN* to include the WLAN measurement results, in order of decreasing RSSI for WLAN APs;
 - 3> if available, set the *logMeasResultListBT* to include the Bluetooth measurement results, in order of decreasing RSSI for Bluetooth beacons;
 - 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
 - 3> set the numberOfPreamblesSent to indicate the number of preambles sent by MAC for the failed random access procedure;
 - 3> set *contentionDetected* to indicate whether contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the failed random access procedure;
 - 3> set *maxTxPowerReached* to indicate whether or not the maximum power level was used for the last transmitted preamble, see TS 36.321 [6];
 - 2> if in RRC_INACTIVE:
 - 3> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12, with release cause 'RRC connection failure';
 - 2> else inform upper layers about the failure to establish the RRC connection or failure to resume the RRC connection with suspend indication, upon which the procedure ends;

The UE may discard the connection establishment failure information, i.e. release the UE variable *VarConnEstFailReport*, 48 hours after the failure is detected, upon power off or upon detach.

5.3.3.7 T302, T303, T305, T306, or T308 expiry or stop

If the UE is connected to EPC, the UE shall:

- 1> if timer T302 expires or is stopped:
 - 2> inform upper layers about barring alleviation for mobile terminating access;
 - 2> if timer T303 is not running:

3> inform upper layers about barring alleviation for mobile originating calls;

- 2> if timer T305 is not running:
 - 3> inform upper layers about barring alleviation for mobile originating signalling;
- 2> if timer T306 is not running:
 - 3> inform upper layers about barring alleviation for mobile originating CS fallback;
- 2> if timer T308 is not running:

3> inform upper layers about barring alleviation for ACDC;

- 1> if timer T303 expires or is stopped:
 - 2> if timer T302 is not running:
 - 3> inform upper layers about barring alleviation for mobile originating calls;
- 1> if timer T305 expires or is stopped:
 - 2> if timer T302 is not running:

3> inform upper layers about barring alleviation for mobile originating signalling;

- 1> if timer T306 expires or is stopped:
 - 2> if timer T302 is not running:
 - 3> inform upper layers about barring alleviation for mobile originating CS fallback;
- 1> if timer T308 expires or is stopped:
 - 2> if timer T302 is not running:

3> inform upper layers about barring alleviation for ACDC;

5.3.3.8 Reception of the *RRCConnectionReject* by the UE

The UE shall:

- 1> stop timer T300;
- 1> stop timer T302, if running;
- 1> reset MAC;
- 1> except for NB-IoT, start timer T302, with the timer value set to the *waitTime*;
- 1> if the UE is a NB-IoT UE; or
- 1> if the *extendedWaitTime* is present and the UE supports delay tolerant access:
 - 2> forward the *extendedWaitTime* to upper layers;
- 1> if *deprioritisationReq* is included and the UE supports RRC Connection Reject with deprioritisation:

2> start or restart timer T325 with the timer value set to the *deprioritisationTimer* signalled;

- 2> store the *deprioritisationReq* until T325 expiry;
- NOTE: The UE stores the deprioritisation request irrespective of any cell reselection absolute priority assignments (by dedicated or common signalling) and regardless of RRC connections in E-UTRAN or other RATs unless specified otherwise.
- 1> if the *RRCConnectionReject* is received in response to an *RRCConnectionResumeRequest* sent to resume a suspended RRC connection:
 - 2> if the *rrc-SuspendIndication* is not present:
 - 3> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity for all established or suspended RBs;
 - 3> discard the stored UE AS context and *resumeIdentity*;
 - 3> inform upper layers about the failure to resume the RRC connection without suspend indication and that access barring for mobile originating calls, mobile originating signalling, mobile terminating access and except for NB-IoT for mobile originating CS fallback is applicable, upon which the procedure ends;

2> else:

3> if the RRCConnectionReject is received in response to an RRCConnectionResumeRequest for EDT:

4> perform the actions upon abortion of UP-EDT as specified in 5.3.3.9a;

3> else:

4> suspend SRB1;

- 3> inform upper layers about the failure to resume the RRC connection with suspend indication and that access barring for mobile originating calls, mobile originating signalling, mobile terminating access and except for NB-IoT for mobile originating CS fallback is applicable, upon which the procedure ends;
- 1> else if the *RRCConnectionReject* is received in response to an *RRCConnectionResumeRequest* sent while in RRC_INACTIVE:
 - 2> release the default MAC configuration;
 - 2> if *RRCConnectionReject* is received in response to a request from upper layers:
 - 3> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2';
 - 2> if RRCConnectionReject is received in response to an RRCConnectionResumeRequest:
 - 3> if resume is triggered by upper layers:
 - 4> inform upper layers about the failure to resume the RRC connection;
 - 3> if resume is triggered due to an RNA update:
 - 4> set the variable *pendingRnaUpdate* to 'TRUE';
 - 3> discard the current KeNB, KRRCenc key, KRRCint, KUPint key and KUPenc key;
 - 3> suspend SRB1, upon which the procedure ends;
 - 2> The UE shall continue to monitor RAN and CN paging while the timer T302 is running.

1> else:

2> release the default MAC configuration;

2> inform upper layers about the failure to establish the RRC connection and that access barring for mobile originating calls, mobile originating signalling, mobile terminating access and except for NB-IoT, for mobile originating CS fallback is applicable, upon which the procedure ends;

5.3.3.9 Abortion of RRC connection establishment

If upper layers abort the RRC connection establishment procedure while the UE has not yet entered RRC_CONNECTED, the UE shall:

- 1> stop timer T300, if running;
- 1> reset MAC, release the MAC configuration and re-establish RLC for all RBs that are established;

5.3.3.9a Abortion of UP-EDT

The UE shall:

- 1> delete the KeNB, KRRCint, KRRCenc and KUPenc keys derived in accordance with 5.3.3.3a;
- 1> re-establish RLC entities for all SRBs and DRBs;
- 1> suspend all SRB(s) and DRB(s) except SRB0;
- 1> configure lower layers to suspend integrity protection and ciphering.

5.3.3.10 Handling of SSAC related parameters

Upon request from the upper layers, the UE shall:

- 1> if SystemInformationBlockType2 includes ac-BarringPerPLMN-List and the ac-BarringPerPLMN-List contains an AC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]):
 - 2> select the AC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers;
 - 2> in the remainder of this procedure, use the selected AC-BarringPerPLMN entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the common access barring parameters included in SystemInformationBlockType2;

1> else:

- 2> in the remainder of this procedure use the common access barring parameters (i.e. presence or absence of these parameters) included in *SystemInformationBlockType2*;
- 1> set the local variables *BarringFactorForMMTEL-Voice* and *BarringTimeForMMTEL-Voice* as follows:
 - 2> if *ssac-BarringForMMTEL-Voice* is present:
 - 3> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11], and
- NOTE: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN.
 - 3> if, for at least one of these Access Classes, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ssac-BarringForMMTEL-Voice* is set to zero:
 - 4> set *BarringFactorForMMTEL-Voice* to one and *BarringTimeForMMTEL-Voice* to zero;
 - 3> else:
 - 4> set BarringFactorForMMTEL-Voice and BarringTimeForMMTEL-Voice to the value of ac-BarringFactor and ac-BarringTime included in ssac-BarringForMMTEL-Voice, respectively;

2> else set BarringFactorForMMTEL-Voice to one and BarringTimeForMMTEL-Voice to zero;

- 1> set the local variables *BarringFactorForMMTEL-Video* and *BarringTimeForMMTEL-Video* as follows:
 - 2> if ssac-BarringForMMTEL-Video is present:
 - 3> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11], and
 - 3> if, for at least one of these Access Classes, the corresponding bit in the *ac-BarringForSpecialAC* contained in *ssac-BarringForMMTEL-Video* is set to zero:
 - 4> set BarringFactorForMMTEL-Video to one and BarringTimeForMMTEL-Video to zero;

3> else:

- 4> set BarringFactorForMMTEL-Video and BarringTimeForMMTEL-Video to the value of ac-BarringFactor and ac-BarringTime included in ssac-BarringForMMTEL-Video, respectively;
- 2> else set BarringFactorForMMTEL-Video to one and BarringTimeForMMTEL-Video to zero;
- 1> forward the variables *BarringFactorForMMTEL-Voice*, *BarringTimeForMMTEL-Voice*, *BarringFactorForMMTEL-Video* and *BarringTimeForMMTEL-Video* to the upper layers;

5.3.3.11 Access barring check

1> if timer T302 or "Tbarring" is running:

2> consider access to the cell as barred;

- 1> else if SystemInformationBlockType2 includes "AC barring parameter":
 - 2> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11], and
- NOTE: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN.
 - 2> for at least one of these valid Access Classes the corresponding bit in the *ac-BarringForSpecialAC* contained in "AC barring parameter" is set to *zero*:

3> consider access to the cell as not barred;

2> else:

- 3> draw a random number '*rand*' uniformly distributed in the range: $0 \le rand < 1$;
- 3> if 'rand' is lower than the value indicated by ac-BarringFactor included in "AC barring parameter":

4> consider access to the cell as not barred;

3> else:

4> consider access to the cell as barred;

1> else:

2> consider access to the cell as not barred;

- 1> if access to the cell is barred and both timers T302 and "Tbarring" are not running:
 - 2> draw a random number '*rand*' that is uniformly distributed in the range $0 \le rand < 1$;
 - 2> start timer "Tbarring" with the timer value calculated as follows, using the *ac-BarringTime* included in "AC barring parameter":

"Tbarring" = (0.7 + 0.6 * rand) * ac-BarringTime;

5.3.3.12 EAB check

The UE shall:

- 1> if *SystemInformationBlockType14* is present:
 - 2> if eab-PerRSRP is included:
 - 3> if the establishmentCause received from higher layers is set to a value other than emergency; and
 - 3> if the UE has no Access Class, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11] :
 - 4> if *eab-PerRSRP* is set to *thresh0*:

5> consider access to the cell as barred when in enhanced coverage as specified in TS 36.304 [4];

- 4> else if *eab-PerRSRP* is set to *thresh1*:
 - 5> if the measured RSRP is less than the first entry in *rsrp-ThresholdsPrachInfoList*:

6> consider access to the cell as barred;

5> else:

6> consider that only the resources indicated for the first CE level are configured;

- 4> else if *eab-PerRSRP* is set to *thresh2*:
 - 5> if the measured RSRP is less than the second entry in *rsrp-ThresholdsPrachInfoList*:

6> consider access to the cell as barred;

5> else:

6> consider that only the resources indicated for the first and second CE levels are configured;

- 4> else if *eab-PerRSRP* is set to *thresh3*:
 - 5> if the measured RSRP is less than the third entry in *rsrp-ThresholdsPrachInfoList*:

6> consider access to the cell as barred;

- 5> else:
 - 6> consider that only the resources indicated for the first, second, and third CE levels are configured;
- 2> if access to the cell is not barred due to *eab-PerRSRP* and *eab-Param* is included:
 - 3> if the *eab-Common* is included in the *eab-Param*:
 - 4> if the UE belongs to the category of UEs as indicated in the *eab-Category* contained in *eab-Common*; and
 - 4> if for the Access Class of the UE, as stored on the USIM and with a value in the range 0..9, the corresponding bit in the *eab-BarringBitmap* contained in *eab-Common* is set to *one*:

5> consider access to the cell as barred;

4> else:

5> consider access to the cell as not barred due to EAB;

- 3> else (the *eab-PerPLMN-List* is included in the *eab-Param*):
 - 4> select the entry in the *eab-PerPLMN-List* corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]);

- 4> if the *eab-Config* for that PLMN is included:
 - 5> if the UE belongs to the category of UEs as indicated in the *eab-Category* contained in *eab-Config*; and
 - 5> if for the Access Class of the UE, as stored on the USIM and with a value in the range 0..9, the corresponding bit in the *eab-BarringBitmap* contained in *eab-Config* is set to *one*:

6> consider access to the cell as barred;

5> else:

6> consider access to the cell as not barred due to EAB;

4> else:

5> consider access to the cell as not barred due to EAB;

1> else:

2> consider access to the cell as not barred due to EAB;

5.3.3.13 Access barring check for ACDC

The UE shall:

1> if timer T302 is running:

2> consider access to the cell as barred;

1> else if SystemInformationBlockType2 includes "ACDC barring parameter":

2> draw a random number '*rand*' uniformly distributed in the range: $0 \le rand < 1$;

2> if 'rand' is lower than the value indicated by ac-BarringFactor included in "ACDC barring parameter":

3> consider access to the cell as not barred;

2> else:

3> consider access to the cell as barred;

1> else:

2> consider access to the cell as not barred;

- 1> if access to the cell is barred and timer T302 is not running:
 - 2> draw a random number '*rand*' that is uniformly distributed in the range $0 \le rand < 1$;
 - 2> start timer "Tbarring" with the timer value calculated as follows, using the *ac-BarringTime* included in "ACDC barring parameter":

"Tbarring" = (0.7+0.6 * rand) * ac-BarringTime.

5.3.3.14 Access Barring check for NB-IoT

The UE shall:

- 1> if *ab-Enabled* included in *MasterInformationBlock-NB / MasterInformationBlock-TDD-NB* is set to *TRUE* and *SystemInformationBlockType14-NB* is broadcast:
 - 2> if *ab-PerNRSRP* is included:

3> if the *establishmentCause* received from higher layers is set to a value other than *mo-ExceptionData*; and

- 3> if the UE has no Access Class, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11]:
 - 4> if *ab-PerNRSRP* is set to *thresh1*:

5> if the measured RSRP is less than the first entry in *rsrp-ThresholdsPrachInfoList*;

6> consider access to the cell as barred;

5> else:

6> consider that only the resources indicated for the first NPRACH repetition level are configured;

- 4> if *ab-PerNRSRP* is set to *thresh2*:
 - 5> if the measured RSRP is less than the second entry in *rsrp-ThresholdsPrachInfoList*;

6> consider access to the cell as barred;

5> else:

6> consider that only the resources indicated for the first and second NPRACH repetition levels are configured;

2> if access to the cell is not barred due to *ab-PerNRSRP* and *ab-Param* is included:

- 3> if the *ab-Common* is included in *ab-Param*:
 - 4> if the UE belongs to the category of UEs as indicated in the *ab-Category* contained in *ab-Common*; and
 - 4> if for the Access Class of the UE, as stored on the USIM and with a value in the range 0..9, the corresponding bit in the *ab-BarringBitmap* contained in *ab-Common* is set to *one*:
 - 5> if the *establishmentCause* received from higher layers is set to *mo-ExceptionData* and *ab-BarringForExceptionData* is set to *FALSE* in the *ab-Common*:

6> consider access to the cell as not barred;

- 5> else:
 - 6> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11] and for at least one of these valid Access Classes for the UE, the corresponding bit in the *ab-BarringForSpecialAC* contained in *ab-Common* is set to *zero*:
- NOTE 1: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/EHPLMN.

7> consider access to the cell as not barred;

6> else:

7> consider access to the cell as barred;

4> else:

5> consider access to the cell as not barred;

- 3> else (the *ab-PerPLMN-List* is included in the *ab-Param*):
 - 4> select the *ab-PerPLMN* entry in *ab-PerPLMN-List* corresponding to the PLMN selected by upper layers (see TS 23.122 [11], TS 24.301 [35]);
 - 4> if the *ab-Config* for that PLMN is included:
 - 5> if the UE belongs to the category of UEs as indicated in the *ab-Category* contained in *ab-Config*; and

- 5> if for the Access Class of the UE, as stored on the USIM and with a value in the range 0..9, the corresponding bit in the *ab-BarringBitmap* contained in *ab-Config* is set to *one*:
 - 6> if the *establishmentCause* received from higher layers is set to *mo-ExceptionData* and *ab-BarringForExceptionData* is set to *FALSE* in the *ab-Config*:
 - 7> consider access to the cell as not barred;
 - 6> else:
 - 7> if the UE has one or more Access Classes, as stored on the USIM, with a value in the range 11..15, which is valid for the UE to use according to TS 22.011 [10] and TS 23.122 [11] and for at least one of these valid Access Classes for the UE, the corresponding bit in the *ab-BarringForSpecialAC* contained in *ab-Config* is set to *zero*:
- NOTE 2: ACs 12, 13, 14 are only valid for use in the home country and ACs 11, 15 are only valid for use in the HPLMN/ EHPLMN.

8> consider access to the cell as not barred;

7> else:

8> consider access to the cell as barred;

5> else:

6> consider access to the cell as not barred;

4> else:

5> consider access to the cell as not barred;

1> else:

2> consider access to the cell as not barred;

5.3.3.15 Failure to deliver NAS information in RRCConnectionSetupComplete message

The UE shall:

- 1> if the UE is a NB-IoT UE and radio link failure occurs before the successful delivery of *RRCConnectionSetupComplete* message has been confirmed by lower layers:
 - 2> inform upper layers about the possible failure to deliver the NAS information contained in the RRCConnectionSetupComplete message;

5.3.3.16 Integrity check failure from lower layers while T300 is running for UP-EDT or RRC_INACTIVE

The UE shall:

- 1> upon receiving integrity check failure indication from lower layers concerning SRB1 or SRB2 while T300 is running for UP-EDT:
 - 2> discard the stored UE AS context and *resumeIdentity*;
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- 1> upon receiving integrity check failure indication from lower layers while T300 is running and if the UE is resuming the RRC connection from RRC_INACTIVE:
 - 2> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.3.17 Inability to comply with *RRCConnectionResume*

The UE shall:

- 1> if the UE is unable to comply with (part of) the configuration included in the *RRCConnectionResume* message;
 - 2> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12 with release cause 'RRC Resume failure'.
- NOTE 1: The UE may apply above failure handling also in case the *RRCConnectionResume* message causes a protocol error for which the generic error handling as defined in 5.7 specifies that the UE shall ignore the message.
- NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/failure.

5.3.4 Initial security activation

5.3.4.1 General

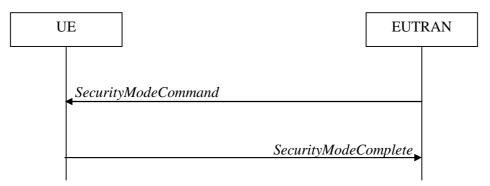


Figure 5.3.4.1-1: Security mode command, successful

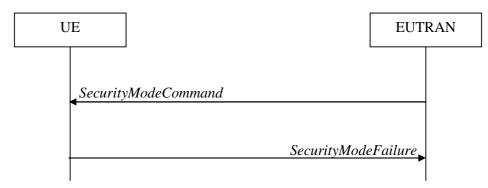


Figure 5.3.4.1-2: Security mode command, failure

The purpose of this procedure is to activate AS security upon RRC connection establishment.

5.3.4.2 Initiation

E-UTRAN initiates the security mode command procedure to a UE in RRC_CONNECTED. Moreover, E-UTRAN applies the procedure as follows:

- when only SRB1, or for NB-IoT SRB1 and SRB1bis, is established, i.e. prior to establishment of SRB2 and/ or DRBs.

5.3.4.3 Reception of the SecurityModeCommand by the UE

The UE shall:

- 1> derive the K_{eNB} key, as specified in TS 33.401 [32] for E-UTRA/EPC, and TS 33.501 [86] for E-UTRA/5GC;
- 1> derive the K_{RRCint} key associated with the *integrityProtAlgorithm* indicated in the *SecurityModeCommand* message, as specified in TS 33.401 [32];
- 1> request lower layers to verify the integrity protection of the SecurityModeCommand message, using the algorithm indicated by the integrityProtAlgorithm as included in the SecurityModeCommand message and the K_{RRCint} key;
- 1> if the SecurityModeCommand message passes the integrity protection check:
 - 2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm* indicated in the *SecurityModeCommand* message, as specified in TS 33.401 [32];
 - 2> if connected as an RN:
 - 3> derive the K_{UPint} key associated with the *integrityProtAlgorithm* indicated in the *SecurityModeCommand* message, as specified in TS 33.401 [32];
 - 2> configure lower layers to apply integrity protection using the indicated algorithm and the K_{RRCint} key immediately, i.e. integrity protection shall be applied to all subsequent messages received and sent by the UE, including the *SecurityModeComplete* message;
 - 2> configure lower layers to apply ciphering using the indicated algorithm, the K_{RRCenc} key and the K_{UPenc} key after completing the procedure, i.e. ciphering shall be applied to all subsequent messages received and sent by the UE, except for the *SecurityModeComplete* message which is sent unciphered;
 - 2> if connected as an RN:
 - 3> configure lower layers to apply integrity protection using the indicated algorithm and the K_{UPint} key, for DRBs that are subsequently configured to apply integrity protection, if any;
 - 2> consider AS security to be activated;
 - 2> upon RRC connection establishment, if UE does not need UL gaps during continuous uplink transmission:
 - 3> configure lower layers to stop using UL gaps during continuous uplink transmission in FDD for SecurityModeComplete message and subsequent uplink transmission in RRC_CONNECTED except for UL transmissions as specified in TS 36.211 [21];
 - 2> submit the SecurityModeComplete message to lower layers for transmission, upon which the procedure ends;
- 1> else:
 - 2> continue using the configuration used prior to the reception of the *SecurityModeCommand* message, i.e. neither apply integrity protection nor ciphering.
 - 2> submit the SecurityModeFailure message to lower layers for transmission, upon which the procedure ends;

5.3.5 RRC connection reconfiguration

5.3.5.1 General

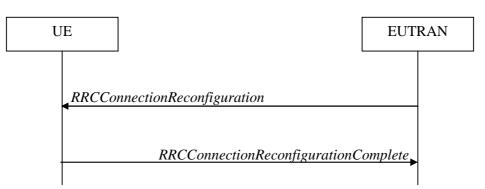


Figure 5.3.5.1-1: RRC connection reconfiguration, successful

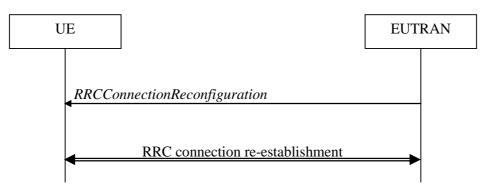


Figure 5.3.5.1-2: RRC connection reconfiguration, failure

The purpose of this procedure is to modify an RRC connection, e.g. to establish/ modify/ release RBs, to perform handover, to setup/ modify/ release measurements, to add/ modify/ release SCells. As part of the procedure, NAS dedicated information may be transferred from E-UTRAN to the UE.

5.3.5.2 Initiation

E-UTRAN may initiate the RRC connection reconfiguration procedure to a UE in RRC_CONNECTED. E-UTRAN applies the procedure as follows:

- the *mobilityControlInfo* is included only when AS-security has been activated, and SRB2 with at least one DRB are setup and not suspended;
- the establishment of RBs (other than SRB1, that is established during RRC connection establishment) is included only when AS security has been activated;
- the addition of SCells is performed only when AS security has been activated;

5.3.5.3 Reception of an *RRCConnectionReconfiguration* not including the *mobilityControlInfo* by the UE

If the *RRCConnectionReconfiguration* message does not include the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

- 1> if this is the first *RRCConnectionReconfiguration* message after successful completion of the RRC connection re-establishment procedure:
 - 2> re-establish PDCP for SRB2 configured with E-UTRA PDCP entity and for all DRBs that are established and configured with E-UTRA PDCP, if any;

- 2> re-establish RLC for SRB2 and for all DRBs that are established and configured with E-UTRA RLC, if any;
- 2> if the *RRCConnectionReconfiguration* message includes the *fullConfig*:

3> perform the radio configuration procedure as specified in 5.3.5.8;

- 2> if the RRCConnectionReconfiguration message includes the radioResourceConfigDedicated:
 - 3> perform the radio resource configuration procedure as specified in 5.3.10;

NOTE 1: Void

NOTE 2: Void

1> else:

- 2> if the RRCConnectionReconfiguration message includes the radioResourceConfigDedicated:
 - 3> perform the radio resource configuration procedure as specified in 5.3.10;
- NOTE 3: If the *RRCConnectionReconfiguration* message includes the establishment of radio bearers other than SRB1, the UE may start using these radio bearers immediately, i.e. there is no need to wait for an outstanding acknowledgment of the *SecurityModeComplete* message.
- 1> if the received RRCConnectionReconfiguration includes the sCellToReleaseList:

2> perform SCell release as specified in 5.3.10.3a;

1> if the received *RRCConnectionReconfiguration* includes the *sCellToAddModList*:

2> perform SCell addition or modification as specified in 5.3.10.3b;

1> if the received *RRCConnectionReconfiguration* includes the *sCellGroupToReleaseList*:

2> perform SCell group release as specified in 5.3.10.3d;

1> if the received RRCConnectionReconfiguration includes the sCellGroupToAddModList:

2> perform SCell group addition or modification as specified in 5.3.10.3e;

- 1> if the received RRCConnectionReconfiguration includes the scg-Configuration; or
- 1> if the current UE configuration includes one or more split DRBs configured with *pdcp-Config* and the received *RRCConnectionReconfiguration* includes *radioResourceConfigDedicated* including *drb-ToAddModList*:

2> perform SCG reconfiguration as specified in 5.3.10.10;

- 1> if the received RRCConnectionReconfiguration includes the nr-Config and it is set to release: or
- 1> if the received RRCConnectionReconfiguration includes endc-ReleaseAndAdd and it is set to TRUE:

2> perform MR-DC release as specified in TS 38.331 [82], clause 5.3.5.10;

1> if the received *RRCConnectionReconfiguration* includes the *sk-Counter*:

2> perform key update procedure as specified in TS 38.331 [82], clause 5.3.5.7;

1> if the received RRCConnectionReconfiguration includes the nr-SecondaryCellGroupConfig:

2> perform NR RRC Reconfiguration as specified in TS 38.331 [82], clause 5.3.5.3;

1> if the received *RRCConnectionReconfiguration* includes the *nr-RadioBearerConfig1*:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> if the received *RRCConnectionReconfiguration* includes the *nr-RadioBearerConfig2*:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> if this is the first *RRCConnectionReconfiguration* message after successful completion of the RRC connection re-establishment procedure:

2> resume SRB2 and all DRBs that are suspended, if any, including RBs configured with NR PDCP;

- NOTE 4: The handling of the radio bearers after the successful completion of the PDCP re-establishment, e.g. the re-transmission of unacknowledged PDCP SDUs (as well as the associated status reporting), the handling of the SN and the HFN, is specified in TS 36.323 [8].
- NOTE 5: The UE may discard SRB2 messages and data that it receives prior to completing the reconfiguration used to resume these bearers.
- 1> if the received RRCConnectionReconfiguration includes the systemInformationBlockType1Dedicated:

2> perfom the actions upon reception of the SystemInformationBlockType1 message as specified in 5.2.2.7;

1> if the received RRCConnectionReconfiguration includes the systemInformationBlockType2Dedicated:

2> perfom the actions upon reception of the *SystemInformationBlockType2* message as specified in 5.2.2.9;

1> if the RRCConnectionReconfiguration message includes the dedicatedInfoNASList:

2> forward each element of the *dedicatedInfoNASList* to upper layers in the same order as listed;

1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:

2> perform the measurement configuration procedure as specified in 5.5.2;

- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> if the *RRCConnectionReconfiguration* message includes the *otherConfig*:

2> perform the other configuration procedure as specified in 5.3.10.9;

1> if the *RRCConnectionReconfiguration* message includes the *sl-DiscConfig* or *sl-CommConfig*:

2> perform the sidelink dedicated configuration procedure as specified in 5.3.10.15;

1> if the *RRCConnectionReconfiguration* message includes the *sl-V2X-ConfigDedicated*:

2> perform the V2X sidelink communication dedicated configuration procedure as specified in 5.3.10.15a;

1> if the *RRCConnectionReconfiguration* message includes *wlan-OffloadInfo*:

2> perform the dedicated WLAN offload configuration procedure as specified in 5.6.12.2;

1> if the RRCConnectionReconfiguration message includes rclwi-Configuration:

2> perform the WLAN traffic steering command procedure as specified in 5.6.16.2;

1> if the *RRCConnectionReconfiguration* message includes *lwa-Configuration*:

2> perform the LWA configuration procedure as specified in 5.6.14.2;

1> if the *RRCConnectionReconfiguration* message includes *lwip-Configuration*:

2> perform the LWIP reconfiguration procedure as specified in 5.6.17.2;

- 1> upon RRC connection establishment, if UE does not need UL gaps during continuous uplink transmission:
 - 2> configure lower layers to stop using UL gaps during continuous uplink transmission in FDD for *RRCConnectionReconfigurationComplete* message and subsequent uplink transmission in RRC_CONNECTED except for UL transmissions as specified in TS36.211 [21];
- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the RRCConnectionReconfiguration message includes perCC-GapIndicationRequest:

3> include *perCC-GapIndicationList* and *numFreqEffective*;

2> if the frequencies are configured for reduced measurement performance:

3> include *numFreqEffectiveReduced*;

2> if the received RRCConnectionReconfiguration message included nr-SecondaryCellGroupConfig:

3> include scg-ConfigResponseNR in accordance with TS 38.331 [82], clause 5.3.5.3;

- 1> if the UE is configured with NE-DC:
 - 2> transfer the RRCConnectionReconfigurationComplete message via SRB1 embedded in NR RRC message RRCReconfigurationComplete as specified in TS 38.331 [82];

1> else:

2> submit the RRCConnectionReconfigurationComplete message to lower layers for transmission using the new configuration, upon which the procedure ends;

5.3.5.4 Reception of an *RRCConnectionReconfiguration* including the *mobilityControlInfo* by the UE (handover)

If the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo* and the UE is able to comply with the configuration included in this message, the UE shall:

- 1> stop timer T310, if running;
- 1> stop timer T312, if running;
- 1> start timer T304 with the timer value set to *t304*, as included in the *mobilityControlInfo*;
- 1> stop timer T370, if running;
- 1> if the *carrierFreq* is included:
 - 2> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;

1> else:

- 2> consider the target PCell to be one on the frequency of the source PCell with a physical cell identity indicated by the *targetPhysCellId*;
- 1> if T309 is running:
 - 2> stop timer T309 for all access categories;
 - 2> perform the actions as specified in 5.3.16.4.
- 1> start synchronising to the DL of the target PCell;
- NOTE 1: The UE should perform the handover as soon as possible following the reception of the RRC message triggering the handover, which could be before confirming successful reception (HARQ and ARQ) of this message.
- 1> if BL UE or UE in CE:
 - 2> if sameSFN-Indication is not present in mobilityControlInfo:

3> acquire the *MasterInformationBlock* in the target PCell;

- 1> if *makeBeforeBreak* is configured:
 - 2> perform the remainder of this procedure including and following resetting MAC after the UE has stopped the uplink transmission/downlink reception with the source PCell;

- NOTE 1a: It is up to UE implementation when to stop the uplink transmission/ downlink reception with the source PCell to initiate re-tuning for connection to the target cell, as specified in TS 36.133 [16], if *makeBeforeBreak* is configured.
- NOTE 1b: It is up to UE implementation when to stop the uplink transmission/ downlink reception with the source SCell(s) after receiving *RRCConnectionReconfiguration* message.
- 1> reset MCG MAC and SCG MAC, if configured;
- 1> release uplinkDataCompression, if configured;
- 1> re-establish PDCP for all RBs configured with *pdcp-config* that are established;
- NOTE 2: The handling of the radio bearers after the successful completion of the PDCP re-establishment, e.g. the re-transmission of unacknowledged PDCP SDUs (as well as the associated status reporting), the handling of the SN and the HFN, is specified in TS 36.323 [8].
- NOTE 2a: At handover the *reestablishPDCP* flag will be set for all RBs configured with NR PDCP in *nr*-*RadioBearerConfig1* or *nr-RadioBearerConfig2* TS 38.331 [82] which will cause the PDCP entity to be re-established also for these RBs.
- 1> re-establish MCG RLC and SCG RLC, if configured, for all RBs that are established;
- 1> for each SCell configured for the UE other than the PSCell:
 - 2> if the received *RRCConnectionReconfiguration* message includes *sCellState* for the SCell and indicates *activated*:

3> configure lower layers to consider the SCell to be in activated state;

2> else if the received RRCConnectionReconfiguration message includes sCellState for the SCell and indicates dormant:

3> configure lower layers to consider the SCell to be in dormant state;

2> else:

3> configure lower layers to consider the SCell to be in deactivated state;

- 1> apply the value of the *newUE-Identity* as the C-RNTI;
- 1> if the *RRCConnectionReconfiguration* message includes the *fullConfig*:
 - 2> perform the radio configuration procedure as specified in 5.3.5.8;
- 1> configure lower layers in accordance with the received *radioResourceConfigCommon*;
- 1> if the received *RRCConnectionReconfiguration* message includes the *rach-Skip*:
 - 2> configure lower layers to apply the *rach-Skip* for the target MCG, as specified in TS 36.213 [23] and 36.321 [6];
- 1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received mobilityControlInfo;
- 1> if the received *RRCConnectionReconfiguration* includes the *sCellToReleaseList*:

2> perform SCell release as specified in 5.3.10.3a;

1> if the received *RRCConnectionReconfiguration* includes the *sCellGroupToReleaseList*:

2> perform SCell group release as specified in 5.3.10.3d;

- 1> if the received *RRCConnectionReconfiguration* includes the *scg-Configuration*; or
- 1> if the current UE configuration includes one or more split DRBs and the received RRCConnectionReconfiguration includes radioResourceConfigDedicated including drb-ToAddModList:

2> perform SCG reconfiguration as specified in 5.3.10.10;

1> if the RRCConnectionReconfiguration message includes the radioResourceConfigDedicated:

2> perform the radio resource configuration procedure as specified in 5.3.10;

- 1> if the *securityConfigHO* (without suffix) is included in the *RRCConnectionReconfiguration*:
 - 2> if the keyChangeIndicator received in the securityConfigHO is set to TRUE:
 - 3> update the K_{eNB} key based on the K_{ASME} key taken into use with the latest successful NAS SMC procedure, as specified in TS 33.401 [32];
 - 2> else:
 - 3> update the K_{eNB} key based on the current K_{eNB} or the NH, using the *nextHopChainingCount* value indicated in the *securityConfigHO*, as specified in TS 33.401 [32];
- NOTE 2b:If the UE needs to update the S-K_{eNB} key as specified in 5.3.10.10, the UE updates the S-K_{eNB} after updating the K_{eNB} key.
 - 2> store the *nextHopChainingCount* value;
 - 2> if the *securityAlgorithmConfig* is included in the *securityConfigHO*:
 - 3> derive the K_{RRCint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
 - 3> if connected as an RN:
 - 4> derive the K_{UPint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
 - 3> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];

2> else:

- 3> derive the K_{RRCint} key associated with the current integrity algorithm, as specified in TS 33.401 [32];
- 3> if connected as an RN:
 - 4> derive the K_{UPint} key associated with the current integrity algorithm, as specified in TS 33.401 [32];
- 3> derive the K_{RRCenc} key and the K_{UPenc} key associated with the current ciphering algorithm, as specified in TS 33.401 [32];
- 2> configure lower layers to apply the integrity protection algorithm and the K_{RRCint} key, i.e. the integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 2> configure lower layers to apply the ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key, i.e. the ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 1> else if the *securityConfigHO-v1530* is included in the *RRCConnectionReconfiguration*:
 - 2> if the *nas-Container* is received:
 - 3> forward the *nas-Container* to upper layers;
 - 2> if the keyChangeIndicator-r15 is received and is set to TRUE:
 - 3> update the KeNB key based on the KAMF key, as specified in TS 33.501 [86];

2> else:

3> update the K_{eNB} key based on the current K_{eNB} or the NH, using the received *nextHopChainingCount-r15*, as specified in TS 33.501 [86];

- 2> store the *nextHopChainingCount-r15* value;
- 2> if the securityAlgorithmConfig-r15 is received:
 - 3> derive the K_{RRCint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];
 - 3> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];

2> else:

- 3> derive the K_{RRCint} key associated with the current integrity algorithm, as specified in TS 33.401 [32];
- 3> derive the K_{RRCenc} key and the K_{UPenc} key associated with the current ciphering algorithm, as specified in TS 33.401 [32];
- 1> if the received *RRCConnectionReconfiguration* includes the *nr-Config* and it is set to *release*; or
- 1> if the received RRCConnectionReconfiguration includes endc-ReleaseAndAdd and it is set to TRUE:

2> perform MR-DC release as specified in TS 38.331 [82], clause 5.3.5.10;

1> if the received *RRCConnectionReconfiguration* includes the *sk-Counter*:

2> perform key update procedure as specified in in TS 38.331 [82], clause 5.3.5.7;

1> if the received RRCConnectionReconfiguration includes the nr-SecondaryCellGroupConfig:

2> perform NR RRC Reconfiguration as specified in TS 38.331 [82], clause 5.3.5.3.

1> if the received *RRCConnectionReconfiguration* includes the *nr-RadioBearerConfig1*:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> if the received RRCConnectionReconfiguration includes the nr-RadioBearerConfig2:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6.

- 1> if connected as an RN:
 - 2> configure lower layers to apply the integrity protection algorithm and the K_{UPint} key, for current or subsequently established DRBs that are configured to apply integrity protection, if any;
- 1> if the received *RRCConnectionReconfiguration* includes the *sCellToAddModList*:

2> perform SCell addition or modification as specified in 5.3.10.3b;

1> if the received RRCConnectionReconfiguration includes the sCellGroupToAddModList:

2> perform SCell group addition or modification as specified in 5.3.10.3e;

1> if the received RRCConnectionReconfiguration includes the systemInformationBlockType1Dedicated:

2> perfom the actions upon reception of the SystemInformationBlockType1 message as specified in 5.2.2.7;

- 1> perform the measurement related actions as specified in 5.5.6.1;
- 1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:

2> perform the measurement configuration procedure as specified in 5.5.2;

- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> release *reportProximityConfig* and clear any associated proximity status reporting timer;
- 1> if the *RRCConnectionReconfiguration* message includes the *otherConfig*:

2> perform the other configuration procedure as specified in 5.3.10.9;

1> if the *RRCConnectionReconfiguration* message includes the *sl-DiscConfig* or *sl-CommConfig*:

2> perform the sidelink dedicated configuration procedure as specified in 5.3.10.15;

1> if the RRCConnectionReconfiguration message includes wlan-OffloadInfo:

2> perform the dedicated WLAN offload configuration procedure as specified in 5.6.12.2;

1> if *handoverWithoutWT-Change* is not configured:

2> release the LWA configuration, if configured, as described in 5.6.14.3;

- 1> release the LWIP configuration, if configured, as described in 5.6.17.3;
- 1> if the *RRCConnectionReconfiguration* message includes *rclwi-Configuration*:

2> perform the WLAN traffic steering command procedure as specified in 5.6.16.2;

1> if the *RRCConnectionReconfiguration* message includes *lwa-Configuration*:

2> perform the LWA configuration procedure as specified in 5.6.14.2;

1> if the *RRCConnectionReconfiguration* message includes *lwip-Configuration*:

2> perform the LWIP reconfiguration procedure as specified in 5.6.17.2;

1> if the RRCConnectionReconfiguration message includes the sl-V2X-ConfigDedicated or mobilityControlInfoV2X:

2> perform the V2X sidelink communication dedicated configuration procedure as specified in 5.3.10.15a;

- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:

3> include *rlf-InfoAvailable*;

2> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and if T330 is not running:

3> include logMeasAvailableMBSFN;

2> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable*;

2> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include logMeasAvailableBT;

2> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include logMeasAvailableWLAN;

2> if the UE has connection establishment failure information available in VarConnEstFailReport and if the RPLMN is equal to plmn-Identity stored in VarConnEstFailReport:

3> include connEstFailInfoAvailable;

- 2> if the RRCConnectionReconfiguration message includes perCC-GapIndicationRequest:
 - 3> include *perCC-GapIndicationList* and *numFreqEffective*;
- 2> if the frequencies are configured for reduced measurement performance:

3> include *numFreqEffectiveReduced*;

- 2> if the UE has flight path information available:
 - 3> include *flightPathInfoAvailable*;
- 2> if the received RRCConnectionReconfiguration message included nr-SecondaryCellGroupConfig:

3> include scg-ConfigResponseNR in accordance with TS 38.331 [82], clause 5.3.5.3;

- 1> submit the RRCConnectionReconfigurationComplete message to lower layers for transmission;
- 1> if MAC successfully completes the random access procedure; or
- 1> if MAC indicates the successful reception of a PDCCH transmission addressed to C-RNTI and if *rach-Skip* is configured:
 - 2> stop timer T304;
 - 2> release rach-Skip;
 - 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
 - 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;
- NOTE 3: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.
 - 2> if the UE is configured to provide IDC indications:
 - 3> if the UE has transmitted an *InDeviceCoexIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*:
 - 4> initiate transmission of the InDeviceCoexIndication message in accordance with 5.6.9.3;
 - 2> if the UE is configured to provide power preference indications, overheating assistance information, SPS assistance information, delay budget report or maximum bandwidth preference indications:
 - 3> if the UE has transmitted a *UEAssistanceInformation* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*:
 - 4> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;
 - 2> if *SystemInformationBlockType15* is broadcast by the PCell:
 - 3> if the UE has transmitted a *MBMSInterestIndication* message during the last 1 second preceding reception of the *RRCConnectionReconfiguration* message including *mobilityControlInfo*:
 - 4> ensure having a valid version of *SystemInformationBlockType15* for the PCell;
 - 4> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;
 - 4> determine the set of MBMS services of interest in accordance with 5.8.5.3a;
 - 4> initiate transmission of the MBMSInterestIndication message in accordance with 5.8.5.4;

2> if SystemInformationBlockType18 is broadcast by the target PCell; and the UE transmitted a SidelinkUEInformation message indicating a change of sidelink communication related parameters relevant in target PCell (i.e. change of commRxInterestedFreq or commTxResourceReq, commTxResourceReqUC if SystemInformationBlockType18 includes commTxResourceUC-ReqAllowed or commTxResourceInfoReqRelay if PCell broadcasts SystemInformationBlockType19 including discConfigRelay) during the last 1 second preceding reception of the RRCConnectionReconfiguration message including mobilityControlInfo; or

- 2> if SystemInformationBlockType19 is broadcast by the target PCell; and the UE transmitted a SidelinkUEInformation message indicating a change of sidelink discovery related parameters relevant in target PCell (i.e. change of discRxInterest or discTxResourceReq, discTxResourceReqPS if SystemInformationBlockType19 includes discConfigPS or discRxGapReq or discTxGapReq if the UE is configured with gapRequestsAllowedDedicated set to true or if the UE is not configured with gapRequestsAllowedDedicated and SystemInformationBlockType19 includes gapRequestsAllowedCommon) during the last 1 second preceding reception of the RRCConnectionReconfiguration message including mobilityControlInfo; or
- 2> if SystemInformationBlockType21 is broadcast by the target PCell; and the UE transmitted a SidelinkUEInformation message indicating a change of V2X sidelink communication related parameters relevant in target PCell (i.e. change of v2x-CommRxInterestedFreqList or v2x-CommTxResourceReq) during the last 1 second preceding reception of the RRCConnectionReconfiguration message including mobilityControlInfo:
 - 3> initiate transmission of the SidelinkUEInformation message in accordance with 5.10.2.3;
- 2> the procedure ends;
- NOTE 4: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell, except for BL UEs or UEs in CE when *sameSFN-Indication* is not present in *mobilityControlInfo*.

5.3.5.5 Reconfiguration failure

The UE shall:

- 1> if the UE is unable to comply with (part of) the configuration included in the *RRCConnectionReconfiguration* message:
 - 2> continue using the configuration used prior to the reception of *RRCConnectionReconfiguration* message;
 - 2> if security has not been activated:

3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause other;

2> else:

- 3> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the connection reconfiguration procedure ends;
- NOTE 1: The UE may apply above failure handling also in case the *RRCConnectionReconfiguration* message causes a protocol error for which the generic error handling as defined in 5.7 specifies that the UE shall ignore the message.
- NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/ failure.
- NOTE 3: The compliance also covers the NR configuration carried within octet strings e.g. field *nr*-*SecondaryCellGroupConfig*. I.e. the failure behaviour defined also applies in case the UE cannot comply with the NR configuration or with the combination of (parts of) the LTE and NR configurations.

5.3.5.6 T304 expiry (handover failure)

The UE shall:

- 1> if T304 expires (handover failure):
- NOTE 1: Following T304 expiry any dedicated preamble, if provided within the *rach-ConfigDedicated*, is not available for use by the UE anymore.
 - 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, the *mac-MainConfig* and the *sps-Config*;

- NOTE 1a: In the context above, "the configuration" includes state variables and parameters of each radio bearer. PDCP entities associtated with RLC UM and SRB bearers are reset after the successful RRC connection re-establishment procedure according to clause 5.2 in TS 36.323 [8]. In the above, "the configuration" includes the RB configuration using NR PDCP, if configured (i.e. by *nr-RadioBearerConfig1* and *nr-RadioBearerConfig2*).
 - 2> store the following handover failure information in *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in *VarRLF-Report*, if any;
 - 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
 - 3> set the measResultLastServCell to include the RSRP and RSRQ, if available, of the source PCell based on measurements collected up to the moment the UE detected handover failure and in accordance with the following;
 - 4> if the UE includes *rsrqResult*, include the *lastServCellRSRQ-Type*;
 - 3> set the *measResultNeighCells* to include the best measured cells, other than the source PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected handover failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the measResultListEUTRA;
 - 4> if the UE includes *rsrqResult*, include the *rsrq-Type*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;
- NOTE 2: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.
 - 3> if available, set the *logMeasResultListWLAN* to include the WLAN measurement results, in order of decreasing RSSI for WLAN APs;
 - 3> if available, set the *logMeasResultListBT* to include the Bluetooth measurement results, in order of decreasing RSSI for Bluetooth beacons;
 - 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
 - 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the target PCell of the failed handover;
 - 3> include *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 3> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
 - 3> set the *connectionFailureType* to 'hof;
 - 3> set the *c*-*RNTI* to the C-RNTI used in the source PCell;

2> initiate the connection re-establishment procedure as specified in 5.3.7, upon which the RRC connection reconfiguration procedure ends;

The UE may discard the handover failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the failure is detected, upon power off or upon detach.

- NOTE 3: E-UTRAN may retrieve the handover failure information using the UE information procedure with *rlf-ReportReq* set to *true*, as specified in 5.6.5.3.
- 5.3.5.7 Void

5.3.5.7a T307 expiry (SCG change failure)

The UE shall:

- 1> if T307 expires:
- NOTE 1: Following T307 expiry any dedicated preamble, if provided within the *rach-ConfigDedicatedSCG*, is not available for use by the UE anymore.
 - 2> initiate the SCG failure information procedure as specified in 5.6.13 to report SCG change failure;

5.3.5.8 Radio Configuration involving full configuration option

The UE shall:

- 1> if the UE is connected to EPC:
 - 2> release/ clear all current dedicated radio configurations except for the following:
 - the MCG C-RNTI,
 - the MCG security configuration,
 - the PDCP, RLC, logical channel configurations for the RBs,
 - the logged measurement configuration;
- 1> else if the UE is connected to 5GC:
 - 2> release/ clear all current dedicated radio configurations except for the following:
 - the MCG C-RNTI,
 - the MCG security configuration,
 - the configurations (SDAP if configured, PDCP, RLC and logical channel) for the RBs;
- NOTE 1: Radio configuration is not just the resource configuration but includes other configurations like *MeasConfig* and *OtherConfig*. In case (NG)EN-DC is configured, this also includes the entire NR SCG configuration. Such NR SCG configuration does not include the DRB configuration as configured by *nr*-*RadioBearerConfig1* and nr-*RadioBearerConfig2*).
- 1> if the *RRCConnectionReconfiguration* message includes the *mobilityControlInfo*:
 - 2> release/ clear all current common radio configurations;
 - 2> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;
- 1> else:
 - 2> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SystemInformationBlockType2* (or *SystemInformationBlockType2-NB* in NB-IoT);
- 1> apply the default physical channel configuration as specified in 9.2.4;

- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> if the UE is a NB-IoT UE; or
- 1> for each *srb-Identity* value included in the *srb-ToAddModList* (SRB reconfiguration):
 - 2> apply the specified configuration defined in 9.1.2 for the corresponding SRB;
 - 2> apply the corresponding default RLC configuration for the SRB specified in 9.2.1.1 for SRB1 or in 9.2.1.2 for SRB2;
 - 2> apply the corresponding default logical channel configuration for the SRB as specified in 9.2.1.1 for SRB1 or in 9.2.1.2 for SRB2;
 - 2> if the corresponding SRB was configured with NR PDCP and the UE is connected to EPC:
 - 3> release the NR PDCP entity and establish it with an E-UTRA PDCP entity and with the current (MCG) security configuration;
- NOTE 1a: The UE applies the LTE ciphering and integrity protection algorithms that are equivalent to the previously configured NR security algorithms.
 - 3> associate the RLC bearer of this SRB with the established PDCP entity;
- NOTE 2: This is to get the SRBs (SRB1 and SRB2 for handover and SRB2 for reconfiguration after reestablishment) to a known state from which the reconfiguration message can do further configuration.
 - 2> else if the UE is connected to 5GC:
 - 3> apply the corresponding default PDCP configuration for the SRB as specified in TS 38.331 [82], clause 9.2.1;
- 1> if the UE is connected to EPC:
 - 2> for each *eps-BearerIdentity* value included in the *drb-ToAddModList* or *nr-RadioBearerConfig1* or *nr-RadioBearerConfig2* that is part of the current E-UTRA and NR UE configuration:
 - 3> release the E-UTRA or NR PDCP entity;
 - 3> release the RLC entity or entities;
 - 3> release the DTCH logical channel;
 - 3> release the *drb-identity*;
- NOTE 3: This will retain the *eps-bearerIdentity* but remove the DRBs including *drb-identity* of these bearers from the current UE configuration and trigger the setup of the DRBs within the AS in clause 5.3.10.3 using the new configuration. The *eps-bearerIdentity* acts as the anchor for associating the released and re-setup DRB. In the AS the DRB re-setup is equivalent with a new DRB setup (including new PDCP and logical channel configurations).
 - 2> for each *eps-BearerIdentity* value that is part of the current E-UTRA and NR UE configuration but not added with same *eps-BearerIdentity* in *drb-ToAddModList* nor in *nr-RadioBearerConfig1* nor in *nr-RadioBearerConfig2*:
 - 3> perform DRB release as specified in 5.3.10.2;

1> if the UE is connected to 5GC:

- 2> for each *pdu-Session* that is part of the current NR UE configuration:
 - 3> release the SDAP entity (clause 5.1.2 in TS 37.324 [97]);
 - 3> release the NR PDCP entity for each DRB associated to the *pdu-Session*;

3> release the RLC entity or entities for each DRB associated to the *pdu-Session*;

- 3> release the DTCH logical channel for each DRB associated to the *pdu-Session*;
- 3> release the *drb-identity* for each DRB associated to the *pdu-Session*;
- NOTE 4: This will retain the *pdu-Session* but remove the DRBs including *drb-identity* of these bearers from the current NR UE configuration and trigger the setup of the DRBs within the AS in clause 5.3.10.3 using the new configuration. The *pdu-Session* acts as the anchor for associating the released and re-setup DRB. In the AS the DRB re-setup is equivalent with a new DRB setup (including new PDCP and logical channel configurations).
 - 2> for each *pdu-Session* that is part of the current NR UE configuration but not added with same *pdu-Session* in *nr-RadioBearerConfig1* nor in *nr-RadioBearerConfig2*:
 - 3> if the procedure was triggered due to handover:
 - 4> indicate the release of the user plane resources for the *pdu-Session* to upper layers after successful handover;
 - 3> else:

4> indicate the release of the user plane resources for the *pdu-Session* to upper layers immediately;

5.3.6 Counter check

5.3.6.1 General

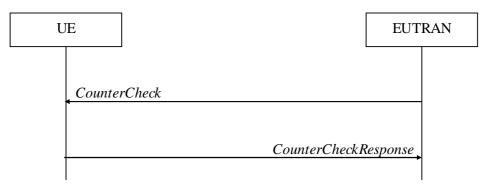


Figure 5.3.6.1-1: Counter check procedure

The counter check procedure is used by E-UTRAN to request the UE to verify the amount of data sent/ received on each DRB. More specifically, the UE is requested to check if, for each DRB, the most significant bits of the COUNT match with the values indicated by E-UTRAN.

NOTE: The procedure enables E-UTRAN to detect packet insertion by an intruder (a 'man in the middle').

5.3.6.2 Initiation

E-UTRAN initiates the procedure by sending a *CounterCheck* message.

NOTE: E-UTRAN may initiate the procedure when any of the COUNT values reaches a specific value.

5.3.6.3 Reception of the *CounterCheck* message by the UE

Upon receiving the CounterCheck message, the UE shall:

- 1> for each DRB that is established:
 - 2> if no COUNT exists for a given direction (uplink or downlink) because it is a uni-directional bearer configured only for the other direction:

3> assume the COUNT value to be 0 for the unused direction;

- 2> if the *drb-Identity* is not included in the *drb-CountMSB-InfoList*:
 - 3> if the DRB is configured with E-UTRA PDCP:
 - 4> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* set to the value of the corresponding COUNT;
 - 3> else if the DRB is configured with NR PDCP:
 - 4> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* set to the value of TX_NEXT 1 and RX_NEXT 1 (specified in TS 38.323 [83]), respectively;
- 2> else if, for at least one direction, the most significant bits of the COUNT are different from the value indicated in the *drb-CountMSB-InfoList*:
 - 3> if the DRB is configured with E-UTRA PDCP:
 - 4> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* set to the value of the corresponding COUNT;
 - 3> else if the DRB is configured with NR PDCP:
 - 4> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* set to the value of TX_NEXT 1 and RX_NEXT 1 (specified in TS 38.323 [83]), respectively;
- 1> for each DRB that is included in the *drb-CountMSB-InfoList* in the *CounterCheck* message that is not established:
 - 2> include the DRB in the *drb-CountInfoList* in the *CounterCheckResponse* message by including the *drb-Identity*, the *count-Uplink* and the *count-Downlink* with the most significant bits set identical to the corresponding values in the *drb-CountMSB-InfoList* and the least significant bits set to zero;

1> submit the CounterCheckResponse message to lower layers for transmission upon which the procedure ends;

5.3.7 RRC connection re-establishment

5.3.7.1 General

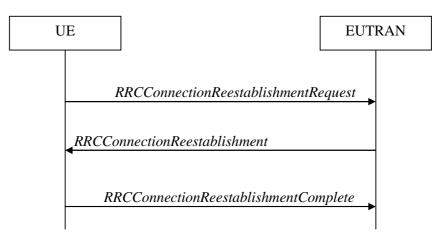


Figure 5.3.7.1-1: RRC connection re-establishment, successful

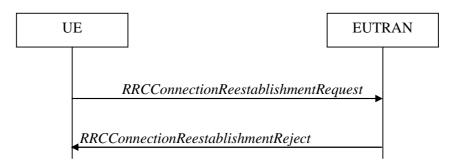


Figure 5.3.7.1-2: RRC connection re-establishment, failure

The purpose of this procedure is to re-establish the RRC connection, which involves the resumption of SRB1 (SRB1bis for a NB-IoT UE for which AS security has not been activated) operation, the re-activation of security (except for a NB-IoT UE for which AS security has not been activated) and the configuration of only the PCell.

Except for a NB-IoT UE for which AS security has not been activated, a UE in RRC_CONNECTED, for which security has been activated, may initiate the procedure in order to continue the RRC connection. The connection reestablishment succeeds only if the concerned cell is prepared i.e. has a valid UE context. In case E-UTRAN accepts the re-establishment, SRB1 operation resumes while the operation of other radio bearers remains suspended. If AS security has not been activated, the UE does not initiate the procedure but instead moves to RRC_IDLE directly.

When AS security has not been activated, a NB-IoT UE supporting RRC connection re-establishment for the Control Plane CIoT EPS optimisation in RRC_CONNECTED may initiate the procedure in order to continue the RRC connection.

E-UTRAN applies the procedure as follows:

- When AS security has been activated:
 - to reconfigure SRB1 and to resume data transfer only for this RB;
 - to re-activate AS security without changing algorithms.
- For a NB-IoT UE supporting RRC connection re-establishment for the Control Plane CIoT EPS optimisation, when AS security has not been activated:
 - to re-establish SRB1bis and to continue data transfer for this RB.

5.3.7.2 Initiation

The UE shall only initiate the procedure either when AS security has been activated or for a NB-IoT UE supporting RRC connection re-establishment for the Control Plane CIoT EPS optimisation. The UE initiates the procedure when one of the following conditions is met:

- 1> upon detecting radio link failure, in accordance with 5.3.11; or
- 1> upon handover failure, in accordance with 5.3.5.6; or
- 1> upon mobility from E-UTRA failure, in accordance with 5.4.3.5; or
- 1> except for UP-EDT, upon integrity check failure indication from lower layers concerning SRB1 or SRB2; or
- 1> upon an RRC connection reconfiguration failure, in accordance with 5.3.5.5; or
- 1> upon an RRC connection reconfiguration failure, in accordance with TS38.331 [82], clause 5.3.5.5.
- NOTE: For UP-EDT, integrity check failure indication from lower layers is handled in accordance with clause 5.3.3.16.

Upon initiation of the procedure, the UE shall:

1> stop timer T310, if running;

- 1> stop timer T312, if running;
- 1> stop timer T313, if running;
- 1> stop timer T307, if running;
- 1> start timer T311;
- 1> stop timer T370, if running;
- 1> release uplinkDataCompression, if configured;
- 1> suspend all RBs, including RBs configured with NR PDCP, except SRB0;

1> reset MAC;

- 1> release the MCG SCell(s), if configured, in accordance with 5.3.10.3a;
- 1> release the SCell group(s), if configured, in accordance with 5.3.10.3d;
- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> except for NB-IoT, for the MCG, apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> for NB-IoT, release *schedulingRequestConfig*, if configured;
- 1> for the MCG, apply the default MAC main configuration as specified in 9.2.2;
- 1> release *powerPrefIndicationConfig*, if configured and stop timer T340, if running;
- 1> release reportProximityConfig, if configured and clear any associated proximity status reporting timer;
- 1> release *obtainLocationConfig*, if configured;
- 1> release *idc-Config*, if configured;
- 1> release *sps-AssistanceInfoReport*, if configured;
- 1> release *measSubframePatternPCell*, if configured;
- 1> release the entire SCG configuration, if configured, except for the DRB configuration (as configured by *drb-ToAddModListSCG*);
- 1> if (NG)EN-DC is configured:
 - 2> perform MR-DC release, as specified in TS 38.331[82], clause 5.3.5.10;
 - 2> release *p-MaxEUTRA*, if configured;
 - 2> release *p-MaxUE-FR1*, if configured;
 - 2> release *tdm-PatternConfig*, if configured;
- 1> release *naics-Info* for the PCell, if configured;
- 1> if connected as an RN and configured with an RN subframe configuration:

2> release the RN subframe configuration;

- 1> release the LWA configuration, if configured, as described in 5.6.14.3;
- 1> release the LWIP configuration, if configured, as described in 5.6.17.3;
- 1> release *delayBudgetReportingConfig*, if configured and stop timer T342, if running;
- 1> perform cell selection in accordance with the cell selection process as specified in TS 36.304 [4];
- 1> release *bw-PreferenceIndicationTimer*, if configured and stop timer T341, if running;

1> release overheatingAssistanceConfig, if configured and stop timer T345, if running;

1> release *ailc-BitConfig*, if configured;

5.3.7.3 Actions following cell selection while T311 is running

Upon selecting a suitable E-UTRA cell, the UE shall:

1> if T309 is running:

2> stop timer T309 for all access categories;

2> perform the actions as specified in 5.3.16.4.

- 1> if the UE is connected to 5GC and the selected cell is only connected to EPC; or
- 1> if the UE is connected to EPC and the selected cell is only connected to 5GC:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

1> else:

- 2> stop timer T311;
- 2> start timer T301;
- 2> apply the *timeAlignmentTimerCommon* included in *SystemInformationBlockType2*;
- 2> if the UE is a NB-IoT UE supporting RRC connection re-establishment for the Control Plane CIoT EPS optimisation and AS security has not been activated; and
- 2> if cp-reestablishment is not included in SystemInformationBlockType2-NB:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

2> else:

3> initiate transmission of the RRCConnectionReestablishmentRequest message in accordance with 5.3.7.4;

NOTE: This procedure applies also if the UE returns to the source PCell.

Upon selecting an inter-RAT cell, the UE shall:

- 1> if the selected cell is a UTRA cell, and if the UE supports Radio Link Failure Report for Inter-RAT MRO, include *selectedUTRA-CellId* in the *VarRLF-Report* and set it to the physical cell identity and carrier frequency of the selected UTRA cell;
- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.7.4 Actions related to transmission of *RRCConnectionReestablishmentRequest* message

Except for NB-IoT, if the procedure was initiated due to radio link failure or handover failure, the UE shall:

1> set the *reestablishmentCellId* in the *VarRLF-Report* to the global cell identity of the selected cell;

The UE shall set the contents of *RRCConnectionReestablishmentRequest* message as follows:

1> except for a NB-IoT UE for which AS security has not been activated, set the *ue-Identity* as follows:

2> set the *c-RNTI* to the C-RNTI used in the source PCell (handover and mobility from E-UTRA failure) or used in the PCell in which the trigger for the re-establishment occurred (other cases);

- 2> set the *physCellId* to the physical cell identity of the source PCell (handover and mobility from E-UTRA failure) or of the PCell in which the trigger for the re-establishment occurred (other cases);
- 2> set the *shortMAC-I* to the 16 least significant bits of the MAC-I calculated:
 - 3> over the ASN.1 encoded as per clause 8 (i.e., a multiple of 8 bits) *VarShortMAC-Input* (or *VarShortMAC-Input-NB* in NB-IoT);
 - 3> with the K_{RRCint} key and integrity protection algorithm that was used in the source PCell (handover and mobility from E-UTRA failure) or of the PCell in which the trigger for the re-establishment occurred (other cases); and
 - 3> with all input bits for COUNT, BEARER and DIRECTION set to binary ones;
- 1> for a NB-IoT UE for which AS security has not been activated, set the *ue-Identity* as follows:
 - 2> request upper layers for calculated ul-NAS-MAC and ul-NAS-Count using the *cellIdentity* indicated in *SystemInformationBlockType1-NB* of the current cell;
 - 2> set the *s*-TMSI to the S-TMSI provided by upper layers;
 - 2> set the *ul-NAS-MAC* to the ul-NAS-MAC value provided by upper layers;
 - 2> set the *ul-NAS-Count* to the ul-NAS-Count value provided by upper layers;
- 1> set the *reestablishmentCause* as follows:
 - 2> if the re-establishment procedure was initiated due to reconfiguration failure as specified in 5.3.5.5 (the UE is unable to comply with the reconfiguration):
 - 3> set the *reestablishmentCause* to the value *reconfigurationFailure*;
 - 2> else if the re-establishment procedure was initiated due to handover failure as specified in 5.3.5.6 (intra-LTE handover failure) or 5.4.3.5 (inter-RAT mobility from EUTRA failure):

3> set the *reestablishmentCause* to the value *handoverFailure*;

2> else:

3> set the *reestablishmentCause* to the value *otherFailure*;

1> if the UE is a NB-IoT UE:

- 2> if the UE supports DL channel quality reporting and *cqi-Reporting* is present in *SystemInformationBlockType2-NB*:
 - 3> set the *cqi-NPDCCH* to include the latest results of the downlink channel quality measurements of the serving cell as specified in TS 36.133 [16];
- NOTE: The downlink channel quality measurements may use measurement period T1 or T2, as defined in TS 36.133 [16]. In case period T2 is used the RRC-MAC interactions are left to UE implementation.

2> set *earlyContentionResolution* to TRUE;

The UE shall submit the RRCConnectionReestablishmentRequest message to lower layers for transmission.

5.3.7.5 Reception of the *RRCConnectionReestablishment* by the UE

NOTE 1: Prior to this, lower layer signalling is used to allocate a C-RNTI. For further details see TS 36.321 [6];

The UE shall:

1> stop timer T301;

- 1> consider the current cell to be the PCell;
- 1> except for a NB-IoT UE for which AS security has not been activated:

- 2> if SRB1 was configured with NR PDCP and the UE is connected to EPC:
 - 3> for SRB1, release the NR PDCP entity and establish an E-UTRA PDCP entity with the current (MCG) security configuration;
- NOTE 1a: The UE applies the LTE ciphering and integrity protection algorithms that are equivalent to the previously configured NR security algorithms.

2> else:

- 3> for SRB1, re-establish the PDCP entity;
- 2> re-establish RLC for SRB1;
- 2> perform the radio resource configuration procedure in accordance with the received radioResourceConfigDedicated and as specified in 5.3.10;
- 2> resume SRB1;
- NOTE 2: E-UTRAN should not transmit any message on SRB1 prior to receiving the *RRCConnectionReestablishmentComplete* message.
 - 2> if UE is connected to EPC, update the K_{eNB} key based on the K_{ASME} key to which the current K_{eNB} is associated, using the *nextHopChainingCount* value indicated in the *RRCConnectionReestablishment* message, as specified in TS 33.401 [32];
 - 2> else if UE is connected to 5GC, update the K_{eNB} key based on the K_{AMF} key to which the current K_{eNB} is associated, using the *nextHopChainingCount* value indicated in the *RRCConnectionReestablishment* message, as specified in TS 33.501 [86];
 - 2> store the nextHopChainingCount value;
 - 2> derive the K_{RRCint} key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];
 - 2> derive the K_{RRCenc} key and the K_{UPenc} key associated with the previously configured ciphering algorithm, as specified in TS 33.401 [32];
 - 2> if connected as an RN:
 - 3> derive the K_{UPint} key associated with the previously configured integrity algorithm, as specified in TS 33.401 [32];
 - 2> configure lower layers to activate integrity protection using the previously configured algorithm and the K_{RRCint} key immediately, i.e., integrity protection shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
 - 2> if connected as an RN:
 - 3> configure lower layers to apply integrity protection using the previously configured algorithm and the K_{UPint} key, for subsequently resumed or subsequently established DRBs that are configured to apply integrity protection, if any;
 - 2> configure lower layers to apply ciphering using the previously configured algorithm, the K_{RRCenc} key and the K_{UPenc} key immediately, i.e., ciphering shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
 - 2> if the UE is not a NB-IoT UE:
 - 3> if the UE is connected to EPC:
 - 4> set the content of *RRCConnectionReestablishmentComplete* message as follows:
 - 5> if the UE has radio link failure or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 6> include the *rlf-InfoAvailable*;

5> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and if T330 is not running:

6> include logMeasAvailableMBSFN;

5> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

6> include the *logMeasAvailable*;

5> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

6> include the logMeasAvailableBT;

5> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

6> include the logMeasAvailableWLAN;

5> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

6> include the connEstFailInfoAvailable;

5> if the UE has flight path information available:

6> include flightPathInfoAvailable;

- 3> perform the measurement related actions as specified in 5.5.6.1;
- 3> perform the measurement identity autonomous removal as specified in 5.5.2.2a;

2> else:

- 3> if the UE supports serving cell idle mode measurements reporting and *servingCellMeasInfo* is present in *SystemInformationBlockType2-NB*:
 - 4> set the *measResultServCell* to include the measurements of the serving cell;
- NOTE 2a: The UE includes the latest results of the serving cell measurements as used for cell selection/ reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
 - 2> submit the RRCConnectionReestablishmentComplete message to lower layers for transmission;
 - 2> if *SystemInformationBlockType15* is broadcast by the PCell:
 - 3> if the UE has transmitted an *MBMSInterestIndication* message during the last 1 second preceding detection of radio link failure:
 - 4> ensure having a valid version of *SystemInformationBlockType15* for the PCell;
 - 4> determine the set of MBMS frequencies of interest in accordance with 5.8.5.3;
 - 4> determine the set of MBMS services of interest in accordance with 5.8.5.3a;
 - 4> initiate transmission of the MBMSInterestIndication message in accordance with 5.8.5.4;
 - 2> if SystemInformationBlockType18 is broadcast by the PCell; and the UE transmitted a SidelinkUEInformation message indicating a change of sidelink communication related parameters relevant in PCell (i.e. change of commRxInterestedFreq or commTxResourceReq, commTxResourceReqUC if SystemInformationBlockType18 includes commTxResourceUC-ReqAllowed or commTxResourceInfoReqRelay if PCell broadcasts SystemInformationBlockType19 including discConfigRelay) during the last 1 second preceding detection of radio link failure; or

- 2> if SystemInformationBlockType19 is broadcast by the PCell; and the UE transmitted a SidelinkUEInformation message indicating a change of sidelink discovery related parameters relevant in PCell (i.e. change of discRxInterest or discTxResourceReq, discTxResourceReqPS if SystemInformationBlockType19 includes discConfigPS or discRxGapReq or discTxGapReq if the UE is configured with gapRequestsAllowedDedicated set to true or if the UE is not configured with gapRequestsAllowedDedicated and SystemInformationBlockType19 includes gapRequestsAllowedCommon) during the last 1 second preceding detection of radio link failure; or
- 2> if *SystemInformationBlockType21* including *sl-V2X-ConfigCommon* is broadcast by the PCell; and the UE transmitted a *SidelinkUEInformation* message indicating a change of V2X sidelink communication related parameters relevant in PCell (i.e. change of *v2x-CommRxInterestedFreqList* or *v2x-CommTxResourceReq*) during the last 1 second preceding detection of radio link failure:

3> initiate transmission of the *SidelinkUEInformation* message in accordance with 5.10.2.3;

- 1> for a NB-IoT UE for which AS security has not been activated:
 - 2> validate *dl-NAS-MAC*, as specified in TS 33.401 [32];
 - 2> if *dl-NAS-MAC* check fails:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure', upon which the procedure ends;
 - 2> except for a UE that only supports the Control Plane CIoT EPS optimisation:
 - 3> re-establish PDCP for SRB1;
 - 3> re-establish RLC for SRB1;
 - 2> re-establish RLC for SRB1bis;
 - 2> perform the radio resource configuration procedure in accordance with the received radioResourceConfigDedicated and as specified in 5.3.10;
 - 2> except for a UE that only supports the Control Plane CIoT EPS optimisation:
 - 3> resume SRB1;
 - 2> resume SRB1bis;
- NOTE 3: E-UTRAN should not transmit any message on SRB1bis prior to receiving the *RRCConnectionReestablishmentComplete* message.
 - 2> if the UE supports serving cell idle mode measurements reporting and *servingCellMeasInfo* is present in *SystemInformationBlockType2-NB*:
 - 3> set the *measResultServCell* to include the measurements of the serving cell;
- NOTE 4: The UE includes the latest results of the serving cell measurements as used for cell selection/ reselection evaluation, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
 - 2> submit the RRCConnectionReestablishmentComplete message to lower layers for transmission;
- 1> the procedure ends;

5.3.7.6 T311 expiry

Upon T311 expiry, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.7.7 T301 expiry or selected cell no longer suitable

The UE shall:

- 1> if timer T301 expires; or
- 1> if the selected cell becomes no longer suitable according to the cell selection criteria as specified in TS 36.304 [4]:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.7.8 Reception of *RRCConnectionReestablishmentReject* by the UE

Upon receiving the RRCConnectionReestablishmentReject message, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.8 RRC connection release

5.3.8.1 General



Figure 5.3.8.1-1: RRC connection release, successful

The purpose of this procedure is:

- to release the RRC connection, which includes the release of the established radio bearers as well as all radio resources; or
- to suspend the RRC connection for both suspended RRC connection or RRC_INACTIVE, which includes the suspension of the established radio bearers.
- to complete the UP-EDT procedure, which includes the release or suspension of the established radio bearers.

5.3.8.2 Initiation

E-UTRAN initiates the RRC connection release procedure to a UE in RRC_CONNECTED or in RRC_INACTIVE or to complete UP-EDT.

5.3.8.3 Reception of the *RRCConnectionRelease* by the UE

The UE shall:

- 1> except for NB-IoT, BL UEs or UEs in CE, delay the following actions defined in this sub-clause 60 ms from the moment the *RRCConnectionRelease* message was received or optionally when lower layers indicate that the receipt of the *RRCConnectionRelease* message has been successfully acknowledged, whichever is earlier;
- 1> for BL UEs or UEs in CE, delay the following actions defined in this sub-clause 1.25 seconds from the moment the *RRCConnectionRelease* message was received or optionally when lower layers indicate that the receipt of the *RRCConnectionRelease* message has been successfully acknowledged, whichever is earlier;

- 1> for NB-IoT, delay the following actions defined in this sub-clause 10 seconds from the moment the *RRCConnectionRelease* message was received or optionally when lower layers indicate that the receipt of the *RRCConnectionRelease* message has been successfully acknowledged, whichever is earlier.
- NOTE: For BL UEs, UEs in CE and NB-IoT, when STATUS reporting, as defined in TS 36.322 [7], has not been triggered and the UE has sent positive HARQ feedback (ACK), as defined in TS 36.321 [6], the lower layers can be considered to have indicated that the receipt of the *RRCConnectionRelease* message has been successfully acknowledged.
- 1> stop T380, if running;
- 1> if the RRCConnectionRelease message is received in response to an RRCConnectionResumeRequest for EDT:
 - 2> indicate to upper layers that the suspended RRC connection has been resumed;
 - 2> discard the stored UE AS context and *resumeIdentity*;
 - 2> stop timer T300;
 - 2> stop timer T302, if running;
 - 2> stop timer T303, if running;
 - 2> stop timer T305, if running;
 - 2> stop timer T306, if running;
 - 2> stop timer T308, if running;
 - 2> perform the actions as specified in 5.3.3.7;
 - 2> stop timer T320, if running;
 - 2> stop timer T322, if running;
- 1> if AS security is not activated and if UE is connected to 5GC:
 - 2> ignore any field included in RRCConnectionRelease message except waitTime;
 - 2> perform the actions upon leaving RRC_CONNECTED or RRC_INACTIVE as specified in 5.3.12 with the release cause '*other*' upon which the procedure ends;
- 1> if the RRCConnectionRelease message includes redirectedCarrierInfo indicating redirection to geran; or
- 1> if the RRCConnectionRelease message includes idleModeMobilityControlInfo including freqPriorityListGERAN:
 - 2> if AS security has not been activated; and
 - 2> if upper layers indicate that redirect to GERAN without AS security is not allowed:
 - 3> ignore the content of the *RRCConnectionRelease*;
 - 3> perform the actions upon leaving RRC_CONNECTED or RRC_INACTIVE as specified in 5.3.12, with release cause 'other', upon which the procedure ends;
- 1> if AS security has not been activated:
 - 2> ignore the content of *redirectedCarrierInfo*, if included and indicating redirection to *nr*;
 - 2> ignore the content of *idleModeMobilityControlInfo*, if included and including *freqPriorityListNR*;
 - 2> if the UE ignores the content of *redirectedCarrierInfo* or of *idleModeMobilityControlInfo*:
 - 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other', upon which the procedure ends;
- 1> if the RRCConnectionRelease message includes redirectedCarrierInfo indicating redirection to eutra and if UE is connected to 5GC:

2> if *cn-Type* is included:

3> after the cell selection, indicate the available CN Type(s) and the received *cn-Type* to upper layers;

- NOTE 1: Handling the case if the E-UTRA cell selected after the redirection does not support the core network type specified by the *cn-Type*, is up to UE implementation.
- 1> if the *RRCConnectionRelease* message includes the *idleModeMobilityControlInfo*:

2> store the cell reselection priority information provided by the *idleModeMobilityControlInfo*;

2> if the *t320* is included:

3> start timer T320, with the timer value set according to the value of t320;

1> else:

- 2> apply the cell reselection priority information broadcast in the system information;
- 1> if the *RRCConnectionRelease* message includes the *measIdleConfig*:
 - 2> clear VarMeasIdleConfig and VarMeasIdleReport;
 - 2> store the received *measIdleDuration* in *VarMeasIdleConfig*;
 - 2> start T331 with the value of *measIdleDuration*;
 - 2> if the *measIdleConfig* contains *measIdleCarrierListEUTRA*:
 - 3> store the received *measIdleCarrierListEUTRA* in *VarMeasIdleConfig*;
 - 3> start performing idle mode measurements as specified in 5.6.20;
- NOTE 2: If the *measIdleConfig* does not contain *measIdleCarrierListEUTRA*, UE may receive *measIdleCarrierListEUTRA* as specified in 5.2.2.12.
- 1> for NB-IoT, if the *RRCConnectionRelease* message includes the *redirectedCarrierInfo*:
 - 2> if the *redirectedCarrierOffsetDedicated* is included in the *redirectedCarrierInfo*:
 - 3> store the dedicated offset for the frequency in *redirectedCarrierInfo*;
 - 3> start timer T322, with the timer value set according to the value of T322 in redirectedCarrierInfo;
- 1> if the release Cause received in the RRCConnectionRelease message indicates loadBalancingTAURequired:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'load balancing TAU required';
- 1> else if the release Cause received in the RRCConnectionRelease message indicates cs-FallbackHighPriority:
 - 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'CS Fallback High Priority';

1> else:

- 2> if the *extendedWaitTime* is present; and
- 2> if the UE supports delay tolerant access or the UE is a NB-IoT UE:
 - 3> forward the *extendedWaitTime* to upper layers;
- 2> if the *extendedWaitTime-CPdata* is present and the NB-IoT UE only supports the Control Plane CIoT EPS optimisation:
 - 3> forward the *extendedWaitTime-CPdata* to upper layers;
- 2> if the release Cause received in the RRCConnectionRelease message indicates rrc-Suspend:

- 3> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC suspension';
- 2> else if *rrc-InactiveConfig* is included:

3> perform the actions upon entering RRC_INACTIVE as specified in 5.3.8.7;

2> else:

3> perform the actions upon leaving RRC_CONNECTED or RRC_INACTIVE as specified in 5.3.12, with release cause 'other';

5.3.8.4 T320 expiry

The UE shall:

- 1> if T320 expires:
 - 2> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo* or inherited from another RAT;
 - 2> apply the cell reselection priority information broadcast in the system information;

5.3.8.5 T322 expiry

The UE shall:

1> if T322 expires:

2> discard the redirectedCarrierOffsetDedicated provided in RRCConnectionRelease message;

5.3.8.6 UE actions upon receiving the expiry of *DataInactivityTimer*

Upon receiving the expiry of *DataInactivityTimer* from lower layers while in RRC_CONNECTED, the UE shall:

1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';

5.3.8.7 UE actions upon entering RRC_INACTIVE

Upon entering RRC_INACTIVE, the UE shall:

- 1> reset MAC and release the default MAC configuration if any;
- 1> stop all timers that are running except T302, T309, T320 and T325;
- 1> re-establish RLC entities for all SRBs and DRBs;
- 1> if the *RRCConnectionRelease* message is including the *waitTime*:
 - 2> start timer T302, with the timer value set according to the *waitTime*;
 - 2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2';

1> if T309 is running:

- 2> stop timer T309 for all access categories;
- 2> perform the actions as specified in 5.3.16.4.
- 1> apply the received *rrc-InactiveConfig*;
- 1> if the *RRCConnectionRelease* message was received in response to an *RRCConnectionResumeRequest*:

2> in the stored UE Inactive AS context:

- 3> replace the K_{eNB} and K_{RRCint} keys with the current K_{eNB} and K_{RRCint} keys;
- 3> replace the C-RNTI with the temporary C-RNTI which the UE has used to receive the RRCConnectionRelease message;
- 3> replace the *cellIdentity* with the *cellIdentity* of the PCell at the time the UE has received the RRCConnectionRelease message;
- 3> replace the previously stored physical cell identity with the physical cell identity of the PCell at the time the UE has received the *RRCConnectionRelease* message;

1> else:

- 2> in the UE Inactive AS Context, the current K_{eNB} and K_{RRCint} keys, the ROHC state, the C-RNTI used in the source PCell, the *cellIdentity* and the physical cell identity of the source PCell, and all other parameters configured;
- 1> if the *periodic-RNAU-timer* is included:
 - 2> start timer T380, with the timer value set to the *periodic-RNAU-timer*;
- 1> suspend all SRB(s) and DRB(s), except SRB0;
- 1> indicate PDCP suspend to lower layers of all DRBs;
- 1> indicate the suspension of the RRC connection to upper layers;
- 1> enter RRC_INACTIVE and perform procedures as specified in TS 36.304 [4], clause 5.2.7;

Upon selecting to an inter-RAT cell or switching to another CN type, the UE shall:

1> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12, with release cause 'other';

5.3.9 RRC connection release requested by upper layers

5.3.9.1 General

The purpose of this procedure is to release the RRC connection. Access to the current PCell may be barred as a result of this procedure.

5.3.9.2 Initiation

The UE initiates the procedure when upper layers request the release of the RRC connection as specified in TS 24. 301 [35] for E-UTRA/EPC and TS 24.501 [95] for E-UTRA/5GC. The UE shall not initiate the procedure for power saving purposes.

The UE shall:

- 1> if the upper layers indicate barring of the PCell:
 - 2> treat the PCell used prior to entering RRC_IDLE as barred according to TS 36.304 [4];
- 1> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';

5.3.10 Radio resource configuration

5.3.10.0 General

The UE shall:

1> if the received radioResourceConfigDedicated includes the srb-ToAddModList:

2> perform the SRB addition or reconfiguration as specified in 5.3.10.1;

- 1> if the received *radioResourceConfigDedicated* includes the *drb-ToReleaseList*:
 2> perform DRB release as specified in 5.3.10.2;
- 1> if the received *radioResourceConfigDedicated* includes the *drb-ToAddModList*:
 2> perform DRB addition or reconfiguration as specified in 5.3.10.3;
- 1> if the received *radioResourceConfigDedicated* includes the *mac-MainConfig*:
 2> perform MAC main reconfiguration as specified in 5.3.10.4;
- 1> if the received *radioResourceConfigDedicated* includes *sps-Config*:
 - 2> perform SPS reconfiguration according to 5.3.10.5;
- 1> if the received *radioResourceConfigDedicated* includes the *physicalConfigDedicated*:

2> reconfigure the physical channel configuration as specified in 5.3.10.6.

1> if the received *radioResourceConfigDedicated* includes the *rlf-TimersAndConstants*:

2> reconfigure the values of timers and constants as specified in 5.3.10.7;

1> if the received *radioResourceConfigDedicated* includes the *measSubframePatternPCell*:

2> reconfigure the time domain measurement resource restriction for the serving cell as specified in 5.3.10.8;

1> if the received *radioResourceConfigDedicated* includes the *naics-Info*:

2> perform NAICS neighbour cell information reconfiguration for the PCell as specified in 5.3.10.13;

1> if the received RadioResourceConfigDedicatedPSCell includes the naics-Info:

2> perform NAICS neighbour cell information reconfiguration for the PSCell as specified in 5.3.10.13;

1> if the received RadioResourceConfigDedicatedSCell-r10 includes the naics-Info:

2> perform NAICS neighbour cell information reconfiguration for the SCell as specified in 5.3.10.13;

1> if the received *radioResourceConfigDedicated* includes the *srb-ToReleaseList*:

2> perform SRB release as specified in 5.3.10.17;

1> if the received radioResourceConfigDedicated includes the schedulingRequestConfig:

2> perform scheduling request reconfiguration for the SCell as specified in 5.3.10.18.

5.3.10.1 SRB addition/ modification

The UE shall:

- 1> if the UE is a NB-IoT UE and SRB1 is not established; or
- 1> for each *srb-Identity* value included in the *srb-ToAddModList* that is not part of the current UE configuration (SRB establishment):
 - 2> if the UE is not a NB-IoT UE that only supports the Control Plane CIoT EPS optimisation:
 - 3> apply the specified configuration defined in 9.1.2 for the corresponding SRB;
 - 3> establish a primary (MCG) RLC entity in accordance with the received *rlc-Config*;
 - 3> establish a primary (MCG) DCCH logical channel in accordance with the received *logicalChannelConfig* and with the logical channel identity set in accordance with 9.1.2;
 - 3> if the same *srb-Identity* is included in NR *srb-ToAddModList*:

4> after processing *nr-RadioBearerConfig1* and *nr-RadioBearerConfig2* if present in the *RRCConnectionReconfiguration* message which triggered the execution of the SRB addition/modification procedure, associate MCG RLC bearer with the NR PDCP entity associated with the same value of *srb-Identity* in the current UE configuration as specified in TS 38.331 [82];

3> else:

- 4> establish a PDCP entity and configure it with the current (MCG) security configuration, if applicable;
- 3> if *rlc-BearerConfigSecondary* is received with value *setup*:
 - 4> establish a secondary MCG RLC entity or entities and an associated DCCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 4> configure the E-UTRA PDCP entity to activate duplication with *t-Reordering* set to *infinity*;
- 2> if the UE is a NB-IoT UE:
 - 3> apply the specified configuration defined in 9.1.2 for SRB1bis;
 - 3> establish an (MCG) RLC entity in accordance with the received *rlc-Config*;
 - 3> establish a (MCG) DCCH logical channel in accordance with the received *logicalChannelConfig* and with the logical channel identity set in accordance with 9.1.2.1a;
- 1> if the UE is a NB-IoT UE and SRB1 is established; or
- 1> for each *srb-Identity* value included in the *srb-ToAddModList* that is part of the current UE configuration (SRB reconfiguration):
 - 2> if *pdcp-verChange* is included (i.e, NR PDCP to E-UTRA PDCP change):
 - 3> establish an (E-UTRA) PDCP entity and configure it with the current (MCG) security configuration;
- NOTE: The UE applies the LTE ciphering and integrity protection algorithms that are equivalent to the previously configured NR security algorithms.
 - 3> associate the primary RLC bearer of this SRB with the established PDCP entity;
 - 3> release the NR PDCP entity of this SRB;
 - 2> reconfigure the primary RLC entity in accordance with the received *rlc-Config*;
 - 2> reconfigure the primary DCCH logical channel in accordance with the received *logicalChannelConfig*;
 - 2> if *rlc-BearerConfigSecondary* is included with value *release*:

3> release the secondary MCG RLC entity or entities as well as the associated DTCH logical channel;

- 2> if *rlc-BearerConfigSecondary* is received with value *setup*:
 - 3> if the current SRB configuration does not include a secondary RLC bearer:
 - 4> establish a secondary MCG RLC entity or entities and an associated DCCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 4> configure the E-UTRA PDCP entity to activate duplication with *t-Reordering* set to *infinity*;

3> else:

4> reconfigure the secondary MCG RLC entity or entities and the associated DCCH logical channel in accordance with the received *rlc-BearerConfigSecondary*;

5.3.10.1a SCG RLC bearer addition or reconfiguration for SRBs

The UE shall:

- 1> for each *srb-Identity* value included in the *srb-ToAddModListSCG* that is not part of the current UE E-UTRA SCG configuration (i.e. SCG RLC bearer establishment):
 - 2> apply the specified configuration defined in 9.1.2 for the corresponding SRB;
 - 2> establish an (SCG) RLC entity in accordance with the received *rlc-Config*;
 - 2> establish a (SCG) DCCH logical channel in accordance with the received *logicalChannelConfig* and with the logical channel identity set in accordance with 9.1.2;
 - 2> if the UE is configured with DC:
 - 3> associate the established SCG RLC bearer and DCCH logical channel with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 3> configure the E-UTRA PDCP entity to activate duplication with *t-Reordering* set to *infinity*;
 - 2> else (i.e. the UE is configured with NE-DC):
 - 3> associate the SCG RLC bearer and DCCH logical channel with the NR PDCP entity, i.e. as configured by NR see TS 38.331 [82], identified with the same *srb-Identity* within the current UE configuration;
- 1> for each *srb-Identity* value included in the *srb-ToAddModListSCG* that is part of the current UE SCG configuration (SCG RLC bearer reconfiguration):
 - 2> re-establish the SCG RLC entity, if *reestablishRLC* is included;
 - 2> reconfigure the RLC entity in accordance with the received *rlc-Config*;
 - 2> reconfigure the DCCH logical channel in accordance with the received *logicalChannelConfig*;

5.3.10.2 DRB release

The UE shall:

- 1> for each *drb-Identity* value included in the *drb-ToReleaseList* or *drb-ToReleaseListSCG* that is part of the current UE configuration (DRB or RLC bearer release); or
- 1> for each *drb-identity* value that is to be released as the result of full configuration option according to 5.3.5.8:
 - 2> if release of this DRB is result of full configuration option according to 5.3.5.8:

3> release the E-UTRA or NR PDCP entity;

2> else if this DRB is configured with *pdcp-config*:

3> release the E-UTRA PDCP entity;

2> else (release the RLC bearer configuration of MCG or of SCG):

3> re-establish the RLC entity as specified in 36.322 for this DRB;

- 2> release the RLC entity or entities;
- 2> release the DTCH logical channel;
- 2> if the UE is connected to EPC:
 - 3> if the DRB was configured with *pdcp-config* and new DRB is not added with same *eps-BearerIdentity* in *drb-ToAddModList* nor *nr-radioBearerConfig1* nor in *nr-radioBearerConfig2*:
 - 4> if the procedure was triggered due to handover:

- 5> indicate the release of the DRB and the *eps-BearerIdentity* of the released DRB to upper layers after successful handover;
- 4> else:
 - 5> indicate the release of the DRB and the *eps-BearerIdentity* of the released DRB to upper layers immediately.
- NOTE 1: The UE does not consider the message as erroneous if the *drb-ToReleaseList* includes any *drb-Identity* value that is not part of the current UE configuration.
- NOTE 2: The association of *eps-BearerIdentity* to an NR PDCP configuration as defined in TS 38.331 [82] can be included in the same message that releases an DRB associated to the same *eps-BearerIdentity*.

5.3.10.3 DRB addition/ modification

The UE shall:

- 1> for each *drb-Identity* value included in the *drb-ToAddModList* that is not part of the current UE configuration (DRB establishment including the case when full configuration option is used):
 - 2> if the concerned entry of *drb-ToAddModList* includes the *drb-TypeLWA* set to *TRUE* (i.e. add LWA DRB):

3> perform the LWA specific DRB addition or reconfiguration as specified in 5.3.10.3a2;

2> if the concerned entry of *drb-ToAddModList* includes the *drb-TypeLWIP* (i.e. add LWIP DRB):

3> perform LWIP specific DRB addition or reconfiguration as specified in 5.3.10.3a3;

- 2> else if *drb-ToAddModListSCG* is not received or does not include the *drb-Identity* value (i.e. add MCG DRB or MCG RLC bearer):
 - 3> if *pdcp-Config* is received, establish a PDCP entity and configure it with the current MCG security configuration and in accordance with the received *pdcp-Config*;
 - 3> if *rlc-Config* is received, establish a (primary) MCG RLC entity or entities in accordance with the received rlc-Config;
 - 3> if logicalChannelIdentity and logicalChannelConfig are received, establish a (primary) MCG DTCH logical channel in accordance with the received logicalChannelIdentity and the received logicalChannelConfig;
 - 3> if *rlc-BearerConfigSecondary* is received with value *setup*:
 - 4> establish a secondary MCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *drb-Identity* within the current UE configuration;
 - 3> if *pdcp-Config* is not received, after processing *nr-RadioBearerConfig1* and *nr-RadioBearerConfig2* if present in the *RRCConnectionReconfiguration* message which triggered the execution of the DRB addition/modification procedure, associate MCG RLC bearer with the NR PDCP entity associated with the same value of *drb-Identity* in the current UE configuration as specified in TS 38.331 [82];
- 2> if a DRB was configured with the same *eps-BearerIdentity* (fullConfig or change to E-UTRA PDCP):

3> associate the established DRB with corresponding included *eps-BearerIdentity*;

- 2> else if the entry of *drb-ToAddModList* includes_*pdcp-config* (establishment of bearer with E-UTRA PDCP):
 - 3> indicate the establishment of the DRB(s) and the *eps-BearerIdentity* of the established DRB(s) to upper layers;
- 1> for each *drb-Identity* value included in the *drb-ToAddModList* that is part of the current UE configuration (DRB reconfiguration):

2> if the DRB indicated by *drb-Identity* is an LWA DRB (i.e. LWA to LTE only or reconfigure LWA DRB):

3> perform the LWA specific DRB reconfiguration as specified in 5.3.10.3a2;

2> else if the concerned entry of *drb-ToAddModList* includes the *drb-TypeLWA* set to *TRUE* (i.e. LTE only to LWA DRB):

3> perform the LWA specific DRB reconfiguration as specified in 5.3.10.3a2;

2> if the concerned entry of *drb-ToAddModList* includes the *drb-TypeLWIP* (i.e. add or reconfigure LWIP DRB):

3> perform LWIP specific DRB addition or reconfiguration as specified in 5.3.10.3a3;

- 2> if *drb-ToAddModListSCG* is not received or does not include the *drb-Identity* value:
 - 3> if the DRB indicated by *drb-Identity* is an MCG DRB or configured with MCG RLC bearer (reconfigure MCG RLC bearer or reconfigure MCG DRB):
 - 4> if the *pdcp-Config* is included:

5> reconfigure the PDCP entity in accordance with the received *pdcp-Config*;

- 4> if the *rlc-Config* is included:
 - 5> if *reestablishRLC* is received:

6> re-establish the primary RLC entity of this DRB;

- 6> if the *logicalChannelIdentity* is included and the DRB indicated by *drb-Identity* is configured with MCG RLC bearer (reconfigure logical channel identity of MCG RLC bearer):
 - 7> reconfigure the primary DTCH logical channel identity in accordance with the received *logicalChannelIdentity*;
- 5> reconfigure the primary RLC entity or entities in accordance with the received *rlc-Config*;
- 4> if the *logicalChannelConfig* is included:
 - 5> reconfigure the primary DTCH logical channel in accordance with the received *logicalChannelConfig*;
- 4> if *rlc-BearerConfigSecondary* is included with value *release*:

5> release the secondary MCG RLC entity or entities as well as the associated DTCH logical channel;

4> if *rlc-BearerConfigSecondary* is included with value *setup*;

5> if the current DRB configuration does not include a secondary RLC bearer:

- 6> establish a secondary MCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
- 5> else:

6> reconfigure the secondary MCG RLC entity or entities and the associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary*;

NOTE: Removal and addition of DRB with *pdcp-Config* with the same *drb-Identity* in a single *radioResourceConfigDedicated* is not supported. In case *drb-Identity* is removed and added due to handover or re-establishment with the full configuration option, the eNB can use the same value of *drb-Identity*.

5.3.10.3a1 DC specific DRB addition or reconfiguration

For the *drb-Identity* value for which this procedure is initiated, the UE shall:

- 1> if *drb-ToAddModListSCG* is received and includes the *drb-Identity* value; and *drb-Identity* value is not part of the current UE configuration (i.e. DC specific DRB establishment):
 - 2> if *drb-ToAddModList* is received and includes the *drb-Identity* value (i.e. add split DRB):
 - 3> establish a PDCP entity and configure it with the current MCG security configuration and in accordance with the *pdcp-Config* included in *drb-ToAddModList*;
 - 3> establish an MCG RLC entity and an MCG DTCH logical channel in accordance with the *rlc-Config*, *logicalChannelIdentity* and *logicalChannelConfig* included in *drb-ToAddModList*;
 - 3> establish an SCG RLC entity and an SCG DTCH logical channel in accordance with the *rlc-ConfigSCG*, *logicalChannelIdentitySCG* and *logicalChannelConfigSCG* included in *drb-ToAddModListSCG*;
 - 2> else (i.e. add SCG DRB):
 - 3> establish a PDCP entity and configure it with the current SCG security configuration and in accordance with the *pdcp-Config* included in *drb-ToAddModListSCG*;
 - 3> establish a primary SCG RLC entity or entities and a primary SCG DTCH logical channel in accordance with the *rlc-ConfigSCG*, *logicalChannelIdentitySCG* and *logicalChannelConfigSCG* included in *drb-ToAddModListSCG*;
 - 3> if *rlc-BearerConfigSecondary* is included with value *setup*;
 - 4> establish a secondary SCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 2> indicate the establishment of the DRB(s) and the *eps-BearerIdentity* of the established DRB(s) to upper layers;
- 1> else (i.e. DC specific DRB modification; *drb-ToAddModList* and/ or *drb-ToAddModListSCG* received):
 - 2> if the DRB indicated by *drb-Identity* is a split DRB:
 - 3> if *drb-ToAddModList* is received and includes the *drb-Identity* value, while for this entry *drb-TypeChange* is included and set to *toMCG* (i.e. split to MCG):
 - 4> release the SCG RLC entity or entities and the SCG DTCH logical channel(s);
 - 4> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
 - 4> reconfigure the primary MCG RLC entity and/ or the primary MCG DTCH logical channel in accordance with the *rlc-Config* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
 - 4> if *rlc-BearerConfigSecondary* is included with value *setup*;
 - 5> establish a secondary MCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 3> else (i.e. reconfigure split):
 - 4> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
 - 4> reconfigure the MCG RLC entity and/ or the MCG DTCH logical channel in accordance with the *rlc-Config* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
 - 4> reconfigure the SCG RLC entity and/ or the SCG DTCH logical channel in accordance with the *rlc-ConfigSCG* and *logicalChannelConfigSCG*, if included in *drb-ToAddModListSCG*;
 - 2> if the DRB indicated by *drb-Identity* is an SCG DRB:
 - 3> if *drb-ToAddModList* is received and includes the *drb-Identity* value, while for this entry *drb-TypeChange* is included and set to *toMCG* (i.e. SCG to MCG):

- 4> reconfigure the PDCP entity with the current MCG security configuration and in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
- 4> reconfigure the SCG RLC entity or entities (both primary and secondary, if configured) and the SCG DTCH logical channel (both primary and secondary, if configured) to be an MCG RLC entity or entities and an MCG DTCH logical channel;
- 4> reconfigure the primary MCG RLC entity or entities and/ or the primary MCG DTCH logical channel in accordance with the *rlc-Config*, *logicalChannelIdentity* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
- 4> if *rlc-BearerConfigSecondary* is included with value *release*:
 - 5> release the secondary MCG RLC entity or entities as well as the associated DTCH logical channel;
- 4> if *rlc-BearerConfigSecondary* is included with value *setup*;
 - 5> if the current DRB configuration does not include a secondary RLC bearer:
 - 6> establish a secondary MCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 5> else:
 - 6> reconfigure the secondary MCG RLC entity or entities and the associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary*;
- 3> else (i.e. *drb-ToAddModListSCG* is received and includes the *drb-Identity* value i.e. reconfigure SCG):
 - 4> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModListSCG*;
 - 4> reconfigure the primary SCG RLC entity or entities and/ or the primary SCG DTCH logical channel in accordance with the *rlc-ConfigSCG* and *logicalChannelConfigSCG*, if included in *drb-ToAddModListSCG*;
 - 4> if *rlc-BearerConfigSecondary* is included with value *release*:
 - 5> release the secondary SCG RLC entity or entities as well as the associated DTCH logical channel;
 - 4> if *rlc-BearerConfigSecondary* is included with value *setup*;
 - 5> if the current DRB configuration does not include a secondary RLC bearer:
 - 6> establish a secondary SCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 5> else:
 - 6> reconfigure the secondary SCG RLC entity or entities and the associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary*;
- 2> if the DRB indicated by *drb-Identity* is an MCG DRB:
 - 3> if *drb-ToAddModListSCG* is received and includes the *drb-Identity* value, while for this entry *drb-Type* is included and set to *split* (i.e. MCG to split):
 - 4> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
 - 4> reconfigure the primary MCG RLC entity and/ or the primary MCG DTCH logical channel in accordance with the *rlc-Config* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
 - 4> if *rlc-BearerConfigSecondary* is included with value *release*:

5> release the secondary MCG RLC entity or entities as well as the associated DTCH logical channel;

- 4> establish an SCG RLC entity and an SCG DTCH logical channel in accordance with the *rlc-ConfigSCG*, *logicalChannelIdentitySCG* and *logicalChannelConfigSCG*, included in *drb-ToAddModListSCG*;
- 3> else (i.e. *drb-Type* is included and set to *scg* i.e. MCG to SCG):
 - 4> reconfigure the PDCP entity with the current SCG security configuration and in accordance with the *pdcp-Config*, if included in *drb-ToAddModListSCG*;
 - 4> reconfigure the MCG RLC entity or entities (both primary and secondary, if configured) and the MCG DTCH logical channel (both primary and secondary, if configured) to be an SCG RLC entity or entities and an SCG DTCH logical channel;
 - 4> reconfigure the primary SCG RLC entity or entities and/ or the primary SCG DTCH logical channel in accordance with the *rlc-ConfigSCG*, *logicalChannelIdentitySCG* and *logicalChannelConfigSCG*, if included in *drb-ToAddModListSCG*;
 - 4> if *rlc-BearerConfigSecondary* is included with value *release*:
 - 5> release the secondary SCG RLC entity or entities as well as the associated DTCH logical channel;
 - 4> if *rlc-BearerConfigSecondary* is included with value *setup*;
 - 5> if the current DRB configuration does not include a secondary RLC bearer:
 - 6> establish a secondary SCG RLC entity or entities and an associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary* and associate these with the E-UTRA PDCP entity with the same value of *srb-Identity* within the current UE configuration;
 - 5> else:
 - 6> reconfigure the secondary SCG RLC entity or entities and the associated DTCH logical channel in accordance with the received *rlc-BearerConfigSecondary*;

5.3.10.3a2 LWA specific DRB addition or reconfiguration

For the *drb-Identity* value for which this procedure is initiated, the UE shall:

- 1> if the *drb-Identity* value is not part of the current UE configuration (i.e. add LWA DRB):
 - 2> establish a PDCP entity and configure it with the current security configuration and in accordance with the pdcp-Config included in drb-ToAddModList;
 - 2> establish an RLC entity and an DTCH logical channel in accordance with the *rlc-Config*, *logicalChannelIdentity* and *logicalChannelConfig* included in *drb-ToAddModList*;
 - 2> enable data handling for this DRB at the LWAAP entity;
 - 2> if *lwa-WLAN-AC* is configured:
 - 3> apply the received *lwa-WLAN-AC* when performing transmissions of packets for this DRB over WLAN;
 - 2> indicate the establishment of the DRB and the *eps-BearerIdentity* of the established DRB to upper layers;

1> else if the DRB indicated by *drb-Identity* is not an LWA DRB (i.e. LTE only to LWA DRB):

- 2> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
- 2> reconfigure the RLC entity and/ or the DTCH logical channel in accordance with the *rlc-Config* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
- 2> enable data handling for this DRB at the LWAAP entity;
- 2> if *lwa-WLAN-AC* is configured:
 - 3> apply the received *lwa-WLAN-AC* when performing transmissions of packets for this DRB over WLAN;

- 1> else if the concerned entry of *drb-ToAddModList* includes the *drb-TypeLWA* set to *FALSE* (i.e. LWA to LTE only DRB):
 - 2> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
 - 2> reconfigure the RLC entity and/ or the DTCH logical channel in accordance with the *rlc-Config* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
 - 2> perform PDCP data recovery as specified in TS 36.323 [8] if bearer is configured with RLC AM;
 - 2> disable data handling for this DRB at the LWAAP entity;
- 1> else (i.e. reconfigure LWA DRB):
 - 2> reconfigure the PDCP entity in accordance with the *pdcp-Config*, if included in *drb-ToAddModList*;
 - 2> reconfigure the RLC entity and/ or the DTCH logical channel in accordance with the *rlc-Config* and *logicalChannelConfig*, if included in *drb-ToAddModList*;
 - 2> if *lwa-WLAN-AC* is configured:

3>apply the received *lwa-WLAN-AC* when performing transmissions of packets for this DRB over WLAN;

5.3.10.3a3 LWIP specific DRB addition or reconfiguration

For the *drb-Identity* value for which this procedure is initiated, the UE shall:

- 1> if the *drb-TypeLWIP* is set to *lwip*:
 - 2> indicate to higher layers to use LWIP resources in both UL and DL for the DRB associated with the *drb-Identity*;
 - 2> if *lwip-DL-Aggregation* is set to TRUE:
 - 3> indicate to higher layers to apply decoding of LWIPEP header with GRE sequence number for both LTE and WLAN DL reception for the DRB associated with the *drb-Identity*;
 - 2> if *lwip-DL-Aggregation* is set to FALSE:
 - 3> indicate to higher layers to stop decoding of LWIPEP header with GRE sequence number for both LTE and WLAN DL reception for the DRB associated with the *drb-Identity*;
 - 2> if *lwip-UL-Aggregation* is set to TRUE:
 - 3> indicate to higher layers to insert LWIPEP header with GRE sequence number for both LTE and WLAN UL transmissions for the DRB associated with the *drb-Identity*;
 - 2> if *lwip-UL-Aggregation* is set to FALSE:
 - 3> indicate to higher layers to stop inserting LWIPEP header with GRE sequence number for both LTE and WLAN UL transmissions for the DRB associated with the *drb-Identity*;
- 1> if the *drb-TypeLWIP* is set to *lwip-DL-only*:
 - 2> indicate to higher layers to use LWIP resources in the DL only for the DRB associated with the *drb-Identity*;
 - 2> if *lwip-DL-Aggregation* is set to TRUE:
 - 3> indicate to higher layers to apply decoding of LWIPEP header with GRE sequence number for both LTE and WLAN DL reception for the DRB associated with the *drb-Identity*;
- 1> if the *drb-TypeLWIP* is set to *lwip-UL-only*:

2> indicate to higher layers to use LWIP resources in the UL only for the DRB associated with the *drb-Identity*;

2> if *lwip-UL-Aggregation* is set to TRUE:

- 3> indicate to higher layers to insert LWIPEP header with GRE sequence number for both LTE and WLAN UL transmissions for the DRB associated with the *drb-Identity*;
- 1> if the *drb-TypeLWIP* is set to *eutran*:

2> indicate to higher layers to stop using LWIP resources for the DRB associated with the *drb-Identity*;

5.3.10.3a4 SCG RLC bearer addition or reconfiguration for DRBs in NE-DC

The UE shall:

1> for each *drb-Identity* value included in *drb-ToAddModListSCG*:

- 2> if *drb-Identity* value is not part of the current UE E-UTRA SCG configuration (SCG RLC bearer establishment):
 - 3> establish an SCG RLC entity or entities and an SCG DTCH logical channel in accordance with the *rlc-ConfigSCG*, *logicalChannelIdentitySCG* and *logicalChannelConfigSCG* included in *drb-ToAddModListSCG*;
 - 3> associate the SCG RLC bearer and DTCH logical channel with the NR PDCP entity, i.e. as configured by NR see TS 38.331 [82], identified with the same *drb-Identity* within the current UE configuration;

2> else:

- 3> re-establish the SCG RLC entity of this DRB, if *reestablishRLC* is included in *rlc-Config*;
- 3> reconfigure the SCG RLC entity or entities and/ or the SCG DTCH logical channel in accordance with the rlc-ConfigSCG and logicalChannelConfigSCG, if included in drb-ToAddModListSCG;

5.3.10.3a SCell release

The UE shall:

- 1> if the release is triggered by reception of the *sCellToReleaseList* or the *sCellToReleaseListSCG*:
 - 2> for each *sCellIndex* value included either in the *sCellToReleaseList* or in the *sCellToReleaseListSCG*:
 - 3> if the current UE configuration includes an SCell with value *sCellIndex*:

4> release the SCell;

- 1> if the release is triggered by RRC connection re-establishment; or
- 1> if the release is triggered when the UE is resuming an RRC connection from a suspended RRC connection or from RRC_INACTIVE as specified in clause 5.3.3.2:

2> release all SCells that are part of the current UE configuration;

5.3.10.3b SCell addition/ modification

The UE shall:

- 1> for each *sCellIndex* value included either in the *sCellToAddModList* or in the *sCellToAddModListSCG* that is not part of the current UE configuration (SCell addition):
 - 2> add the SCell, corresponding to the *cellIdentification*, in accordance with the *radioResourceConfigCommonSCell* and *radioResourceConfigDedicatedSCell*, both included either in the *sCellToAddModList* or in the *sCellToAddModListSCG*;
 - 2> if *sCellState* is configured for the SCell and indicates *activated*:

3> configure lower layers to consider the SCell to be in activated state;

2> else if *sCellState* is configured for the SCell and indicates *dormant*:

3> configure lower layers to consider the SCell to be in dormant state;

2> else:

- 3> configure lower layers to consider the SCell to be in deactivated state;
- 2> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 3> if SCells are not applicable for the associated measurement; and
 - 3> if the concerned SCell is included in *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*:
 - 4> remove the concerned SCell from *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
- 1> for each *sCellIndex* value included either in the *sCellToAddModList* or in the *sCellToAddModListSCG* that is part of the current UE configuration (SCell modification):
 - 2> modify the SCell configuration in accordance with the *radioResourceConfigDedicatedSCell*, included either in the *sCellToAddModList* or in the *sCellToAddModListSCG*;

5.3.10.3c PSCell addition or modification

The UE shall:

- 1> if the PSCell is not part of the current UE configuration (i.e. PSCell addition):
 - 2> add the PSCell, corresponding to the *cellIdentification*, in accordance with the received *radioResourceConfigCommonPSCell* and *radioResourceConfigDedicatedPSCell*;
 - 2> configure lower layers to consider the PSCell to be in activated state;
- 1> if the PSCell is part of the current UE configuration (i.e. PSCell modification):

2> modify the PSCell configuration in accordance with the received *radioResourceConfigDedicatedPSCell*;

5.3.10.3d SCell group release

The UE shall:

- 1> if the release is triggered by reception of the *sCellGroupToReleaseList*:
 - 2> for each *sCellGroupIndex* value included in the *sCellGroupToReleaseList*:
 - 3> if the current UE configuration includes an SCell with value *sCellGroupIndex*:
 - 4> consider the SCell not to be part of the SCell group indicated by *sCellGroupIndex*;
 - 4> consider the *sCellConfigCommon* of the SCell group to be not applicable for the SCell;
 - 3> release the SCell group;
- 1> if the release is triggered by RRC connection re-establishment:
 - 2> release all SCell groups that are part of the current UE configuration;

5.3.10.3e SCell group addition/ modification

- 1> for each *sCellGroupIndex* value included in the *sCellGroupToAddModList* that is part of the current UE configuration (SCell group modification):
 - 2> for each *sCellIndex* value included in the *sCellToReleaseList* that is part of the SCell group indicated by *sCellGroupIndex* (SCell deletion from SCell group):

- 3> consider the *sCellConfigCommon* of the SCell group to be not applicable for the SCell;
- 3> consider the SCell not to be part of the SCell group indicated by sCellGroupIndex
- 2> for each sCellIndex value included in the sCellToAddModList that is not part of the SCell group indicated by sCellGroupIndex (SCell addition to SCell group):
 - 3> consider the SCell to be part of the SCell group indicated by sCellGroupIndex;
 - 3> apply the SCell configuration for parameters not already configured as part of the current SCell configuration in accordance with the *sCellConfigCommon* for the SCell group;
- 2> if *sCellConfigCommon* is included (modify the SCell group configuration):
 - 3> for each SCell that is part of the current SCell group indicated by *sCellGroupIndex*:
 - 4> apply the SCell configuration for parameters not already configured as part of the current SCell configuration in accordance with the *sCellConfigCommon* for the SCell group;
- 1> for each *sCellGroupIndex* value included in the *sCellGroupToAddModList* that is not part of the current UE configuration (SCell group addition):
 - 2> for each sCellIndex value included in the sCellToAddModList (SCell addition to the group):
 - 3> consider the SCell to be part of the SCell group indicated by sCellGroupIndex
 - 3> apply the SCell configuration for parameters not already configured as part of the current SCell configuration in accordance with the *sCellConfigCommon* for the SCell group;

5.3.10.4 MAC main reconfiguration

Except for NB-IoT, the UE shall:

- 1> if the procedure is triggered to perform SCG MAC main reconfiguration:
 - 2> if SCG MAC is not part of the current UE configuration (i.e. SCG establishment):

3> create an SCG MAC entity;

- 2> reconfigure the SCG MAC main configuration as specified in the following i.e. assuming it concerns the SCG MAC whenever MAC main configuration is referenced and that it is based on the received *mac-MainConfigSCG* instead of *mac-MainConfig*:
- 1> reconfigure the MAC main configuration in accordance with the received *mac-MainConfig* other than *stag-ToReleaseList* and *stag-ToAddModList*;
- 1> if the received *mac-MainConfig* includes the *stag-ToReleaseList*:
 - 2> for each STAG-Id value included in the stag-ToReleaseList that is part of the current UE configuration:

3> release the STAG indicated by STAG-Id;

- 1> if the received *mac-MainConfig* includes the *stag-ToAddModList*:
 - 2> for each stag-Id value included in stag-ToAddModList that is not part of the current UE configuration (STAG addition):
 - 3> add the STAG, corresponding to the *stag-Id*, in accordance with the received *timeAlignmentTimerSTAG*;
 - 2> for each *stag-Id* value included in *stag-ToAddModList* that is part of the current UE configuration (STAG modification):
 - 3> reconfigure the STAG, corresponding to the *stag-Id*, in accordance with the received *timeAlignmentTimerSTAG*;

For NB-IoT, the UE shall:

1> reconfigure the MAC main configuration in accordance with the received *mac-MainConfig*;

5.3.10.5 Semi-persistent scheduling reconfiguration

The UE shall:

1> reconfigure the semi-persistent scheduling in accordance with the received *sps-Config*;

5.3.10.6 Physical channel reconfiguration

Except for NB-IoT, the UE shall:

1> if the *antennaInfo-r10* is included in the received *physicalConfigDedicated* and the previous version of this field that was received by the UE was *antennaInfo* (without suffix i.e. the version defined in REL-8):

2> apply the default antenna configuration as specified in 9.2.4;

1> if the *cqi-ReportConfig-r10* is included in the received *physicalConfigDedicated* and the previous version of this field that was received by the UE was *cqi-ReportConfig* (without suffix i.e. the version defined in REL-8):

2> apply the default CQI reporting configuration as specified in 9.2.4;

NOTE: Application of the default configuration involves release of all extensions introduced in REL-9 and later.

- 1> reconfigure the physical channel configuration in accordance with the received *physicalConfigDedicated*;
- 1> if the *antennaInfo* is included and set to *explicitValue*:

2> if the configured *transmissionMode* is *tm1*, *tm2*, *tm5*, *tm6* or *tm7*; or

- 2> if the configured *transmissionMode* is *tm8* and *pmi-RI-Report* is not present; or
- 2> if the configured *transmissionMode* is *tm9* and *pmi-RI-Report* is not present; or
- 2> if the configured *transmissionMode* is *tm*9 and *pmi-RI-Report* is present and *antennaPortsCount* within *csi-RS* is set to *an*1:

3> release *ri-ConfigIndex* in *cqi-ReportPeriodic*, if previously configured;

1> else if the *antennaInfo* is included and set to *defaultValue*:

2> release *ri-ConfigIndex* in *cqi-ReportPeriodic*, if previously configured;

- 1> if the *pusch-EnhancementsConfig* is included in the received *physicalConfigDedicated*, for the associated serving cell:
 - 2> if PUSCH enhancement mode is previously released or not configured and *pusch-EnhancementsConfig* is set to *setup*, or
 - 2> if PUSCH enhancement mode is previously configured and *pusch-EnhancementConfig* is set to *release*:

3> instruct the associated MAC entity to perform partial reset;

- 1> if the procedure was not triggered due to handover and *ce-Mode* is included in the received *physicalConfigDedicated*, for the associated serving cell:
 - 2> if ce-Mode is not currently configured and ce-Mode is set to setup, or
 - 2> if *ce-Mode* is currently configured and *ce-Mode* is set to *release*:

3> instruct the associated MAC entity to perform partial reset;

For NB-IoT, the UE shall:

1> if the *carrierConfigDedicated* is not included in the received *physicalConfigDedicated*:

2> if the UE is configured with a carrier configuration previously received in *carrierConfigDedicated*:

3> use the carrier configuration received in *carrierConfigDedicated*;

2> else:

3> use the carrier configuration received in system information for the uplink and downlink carrier used during the random access procedure;

1> else:

2> use the carrier configuration received in *carrierConfigDedicated*;

2> start to use the new carrier immediately after the last transport block carrying the RRC message has been acknowledged by the MAC layer, and any subsequent RRC response message sent for the current RRC procedure is therefore sent on the new carrier;

1> reconfigure the physical channel configuration in accordance with the received *physicalConfigDedicated*.

5.3.10.7 Radio Link Failure Timers and Constants reconfiguration

The UE shall:

- 1> if the received *rlf-TimersAndConstants* is set to release:
 - 2> use values for timers T301, T310, T311 and constants N310, N311, as included in *ue-TimersAndConstants* received in *SystemInformationBlockType2* (or *SystemInformationBlockType2-NB* in NB-IoT);

1> else:

2> reconfigure the value of timers and constants in accordance with received *rlf-TimersAndConstants*;

- 1> if the received *rlf-TimersAndConstantsSCG* is set to release:
 - 2> stop timer T313, if running, and
 - 2> release the value of timer *t313* as well as constants *n313* and *n314*;
- 1> else:

2> reconfigure the value of timers and constants in accordance with received *rlf-TimersAndConstantsSCG*;

5.3.10.8 Time domain measurement resource restriction for serving cell

The UE shall:

1> if the received *measSubframePatternPCell* is set to *release*:

2> release the time domain measurement resource restriction for the PCell, if previously configured

- 1> else:
 - 2> apply the time domain measurement resource restriction for the PCell in accordance with the received measSubframePatternPCell;

5.3.10.9 Other configuration

The UE shall:

- 1> if the received *otherConfig* includes the *reportProximityConfig*:
 - 2> if *proximityIndicationEUTRA* is set to *enabled*:
 - 3> consider itself to be configured to provide proximity indications for E-UTRA frequencies in accordance with 5.3.14;

- 3> consider itself not to be configured to provide proximity indications for E-UTRA frequencies;
- 2> if *proximityIndicationUTRA* is set to *enabled*:
 - 3> consider itself to be configured to provide proximity indications for UTRA frequencies in accordance with 5.3.14;

2> else:

3> consider itself not to be configured to provide proximity indications for UTRA frequencies;

1> if the received *otherConfig* includes the *obtainLocation*:

2> attempt to have detailed location information available for any subsequent measurement report;

- NOTE: The UE is requested to attempt to have valid detailed location information available whenever sending a measurement report for which it is configured to include available detailed location information. The UE may not succeed e.g. because the user manually disabled the GPS hardware, due to no/poor satellite coverage. Further details, e.g. regarding when to activate GNSS, are up to UE implementation.
- 1> if the received *otherConfig* includes the *bt-NameListConfig*:
 - 2> if bt-NameListConfig is set to setup, attempt to have Bluetooth measurement results available for subsequent measurement report;
- 1> if the received *otherConfig* includes the *wlan-NameListConfig*:
 - 2> if wlan-NameListConfig is set to setup, attempt to have WLAN measurement results available for subsequent measurement report;
- NOTE: The UE is requested to attempt to have valid Bluetooth measurements and WLAN measurements whenever sending a measurement report for which it is configured to include these measurements. The UE may not succeed e.g. because the user manually disabled the WLAN or Bluetooth hardware. Further details, e.g. regarding when to activate WLAN or Bluetooth, are up to UE implementation.
- 1> if the received *otherConfig* includes the *idc-Config*:
 - 2> if *idc-Indication* is included (i.e. set to *setup*):
 - 3> consider itself to be configured to provide IDC indications in accordance with 5.6.9;
 - 3> if *idc-Indication-UL-CA* is included (i.e. set to *setup*):
 - 4> consider itself to be configured to indicate UL CA related information in IDC indications in accordance with 5.6.9;
 - 3> if *idc-HarwareSharingIndication* is included (i.e. set to setup):
 - 4> consider itself to be configured to indicate IDC hardware sharing problem indications in IDC indications in accordance with 5.6.9;
 - 3> if *idc-Indication-MRDC* is included (i.e. set to *setup*):
 - 4> consider itself to be configured to provide IDC indications for MR-DC in accordance with 5.6.9;

2>else:

3> consider itself not to be configured to provide IDC indications;

- 2> if autonomousDenialParameters is included:
 - 3> consider itself to be allowed to deny any transmission in a particular UL subframe if during the number of subframes indicated by *autonomousDenialValidity*, preceeding and including this particular subframe, it autonomously denied fewer UL subframes than indicated by *autonomousDenialSubframes*;

3> consider itself not to be allowed to deny any UL transmission;

1> if the received *otherConfig* includes the *powerPrefIndicationConfig*:

2> if powerPrefIndicationConfig is set to setup:

3> consider itself to be configured to provide power preference indications in accordance with 5.6.10;

2> else:

3> consider itself not to be configured to provide power preference indications;

- 1> if the received *otherConfig* includes the sps-AssistanceInfoReport:
 - 2> if sps-AssistanceInfoReport is set to TRUE:

3> consider itself to be configured to provide SPS assistance information in accordance with 5.6.10;

2> else

3> consider itself not to be configured to provide SPS assistance information;

- 1> if the received *otherConfig* includes the *bw-PreferenceIndicationTimer*.
 - 2> consider itself to be configured to provide maximum PDSCH/PUSCH bandwidth preference indication in accordance with 5.6.10;

1> else:

2> consider itself not to be configured to provide maximum PDSCH/PUSCH bandwidth indication preference;

- 1> if the received *otherConfig* includes the *delayBudgetReportingConfig*:
 - 2> if *delayBudgetReportingConfig* is set to *setup*:

3 > consider itself to be configured to send delay budget reports in accordance with 5.6.10;

2> else:

3> consider itself not to be configured to send delay budget reports and stop timer T342, if running;

1> if the received *otherConfig* includes the *overheatingAssistanceConfig*:

- 2> if overheatingAssistanceConfig is set to setup:
 - 3> consider itself to be configured to provide overheating assistance information in accordance with 5.6.10;

2> else:

- 3> consider itself not to be configured to provide overheating assistance information and stop timer T345, if running;
- 1> for BL UEs or UEs in CE, if the received *otherConfig* includes the *rlm-ReportConfig*:
 - 2> if *rlm-ReportConfig* is set to *setup*:
 - 3> consider itself to be configured to detect "early-out-of-sync" and "early-in-sync" RLM events as specified in 5.3.11;
 - 3> if *rlmReportRep-MPDCCH* is set to *setup*:

4> consider itself to be configured to report *rlmReportRep-MPDCCH* in accordance with 5.6.10;

- 3> consider itself not to be configured to detect "early-out-of-sync" and "early-in-sync" RLM events and stop timer T343, timer T344, timer T314 and timer T315 if running;
- 1> if the received *otherConfig* includes the *measConfigAppLayer*:

2> if *measConfigAppLayer* is set to setup:

- 3> forward measConfigAppLayerContainer to upper layers considering the serviceType;
- 3> consider itself to be configured to send application layer measurement report in accordance with 5.6.19;

2> else:

- 3> inform upper layers to clear the stored application layer measurement configuration;
- 3> discard received application layer measurement report information from upper layers;
- 3> consider itself not to be configured to send application layer measurement report.
- 1> if the received *otherConfig* includes the *ailc-BitConfig*:
 - 2> if *ailc-BitConfig* is set to TRUE:
 - 3> consider itself to be configured to provide assistance information bit for local cache as specified in TS 36.323 [8], clause 6.2.3;

2> else:

3> consider itself not to be configured to provide assistance information bit for local cache;

5.3.10.10 SCG reconfiguration

The UE shall:

- 1> if makeBeforeBreakSCG is configured:
 - 2> stop timer T313, if running;
 - 2> start timer T307 with the timer value set to t307, as included in the mobilityControlInfoSCG;
 - 2> start synchronising to the DL of the target PSCell, if needed;
 - 2> perform the remainder of this procedure including and following resetting MAC after the UE has stopped the uplink transmission/downlink reception with the source PSCell;
- NOTE 0a: It is up to UE implementation when to stop the uplink transmission/ downlink reception with the source PSCell to initiate re-tuning for the connection to the target cell, as specified in TS 36.133 [16], if *makeBeforeBreakSCG* is configured.
- NOTE 0b:It is up to UE implementation when to stop the uplink transmission/ downlink reception with the source SCG SCell(s) after receiving *mobilityControlInfoSCG*.
- 1> if *scg-Configuration* is received and is set to *release* or includes the *mobilityControlInfoSCG* (i.e. SCG release/ change):
 - 2> if *mobilityControlInfo* is not received (i.e. SCG release/ change without HO):
 - 3> reset SCG MAC, if configured;
 - 3> if the UE is not configured with NE-DC:
 - 4> for each *drb-Identity* value that is part of the current UE configuration:
 - 5> if the DRB indicated by *drb-Identity* is an SCG DRB:
 - 6> re-establish the PDCP entity and the SCG RLC entity or entities;
 - 5> if the DRB indicated by *drb-Identity* is a split DRB:

6> perform PDCP data recovery and re-establish the SCG RLC entity;

5> if the DRB indicated by *drb-Identity* is an MCG DRB; and

5> *drb-ToAddModListSCG* is received and includes the *drb-Identity* value, while for this entry *drb-Type* is included and set to *scg* (i.e. MCG to SCG):

6> re-establish the PDCP entity and the MCG RLC entity or entities;

- 3> configure lower layers to consider the SCG SCell(s), except for the PSCell, to be in deactivated state;
- 1> if *scg-Configuration* is received and is set to *release*:
 - 2> release the entire SCG configuration, except for the DRB configuration (i.e. as configured by *drb-ToAddModListSCG*);
 - 2> if the current UE configuration includes one or more split or SCG DRBs and the received RRCConnectionReconfiguration message includes radioResourceConfigDedicated including drb-ToAddModList:

3> reconfigure the SCG or split DRB by *drb-ToAddModList* as specified in 5.3.10.12;

- 2> stop timer T313, if running;
- 2> stop timer T307, if running;

1> else:

- 2> if *scg-ConfigPartMCG* is received and includes the *scg-Counter*:
 - 3> update the S-K_{eNB} key based on the K_{eNB} key and using the received *scg-Counter* value, as specified in TS 33.401 [32];
 - 3> derive the K_{UPenc} key associated with the *cipheringAlgorithmSCG* included in *mobilityControlInfoSCG* within the received *scg-ConfigPartSCG*, as specified in TS 33.401 [32];
 - 3> configure lower layers to apply the ciphering algorithm and the K_{UPenc} key;
- 2> if scg-ConfigPartSCG is received and includes the radioResourceConfigDedicatedSCG:

3> reconfigure the dedicated radio resource configuration for the SCG as specified in 5.3.10.11;

- 2> if the current UE configuration includes one or more split or SCG DRBs and the received RRCConnectionReconfiguration message includes radioResourceConfigDedicated including drb-ToAddModList:
 - 3> reconfigure the SCG or split DRB by *drb-ToAddModList* as specified in 5.3.10.12;
- 2> if scg-ConfigPartSCG is received and includes measConfigSN:
 - 3> for *measConfigSN* perform the actions as specified in 5.5.2 for *measConfig* unless explicitly stated otherwise;
- 2> if scg-ConfigPartSCG is received and includes the sCellToReleaseListSCG:
 - 3> perform SCell release for the SCG as specified in 5.3.10.3a;
- 2> if *scg-ConfigPartSCG* is received and includes the *pSCellToAddMod*:
 - 3> perform PSCell addition or modification as specified in 5.3.10.3c;
- NOTE 0: This procedure is also used to release the PSCell e.g. PSCell change, SI change for the PSCell.
 - 2> if scg-ConfigPartSCG is received and includes the sCellToAddModListSCG:
 - 3> perform SCell addition or modification as specified in 5.3.10.3b;
 - 2> configure lower layers in accordance with mobilityControlInfoSCG, if received;
 - 2> if *rach-SkipSCG* is configured:

- 3> configure lower layers to apply the *rach-SkipSCG* for the target SCG, as specified in TS 36.213 [23] and TS 36.321 [6];
- 2> if scg-ConfigPartSCG is received and includes the mobilityControlInfoSCG (i.e. SCG change):

3> resume all SCG DRBs and resume SCG transmission for split DRBs, if suspended;

- 3> stop timer T313, if running;
- 3> start timer T307 with the timer value set to t307, as included in the mobilityControlInfoSCG, if makeBeforeBreakSCG is not configured;
- 3> start synchronising to the DL of the target PSCell;
- 3> initiate the random access procedure on the PSCell, as specified in TS 36.321 [6], if *rach-SkipSCG* is not configured:
- NOTE 1: The UE is not required to determine the SFN of the target PSCell by acquiring system information from that cell before performing RACH access in the target PSCell.
 - 3> the procedure ends, except that the following actions are performed when MAC successfully completes the random access procedure on the PSCell or when MAC indicates the successful reception of a PDCCH transmission addressed to C-RNTI and if *rach-skipSCG* is configured:
 - 4> stop timer T307;
 - 4> release rach-SkipSCG;
 - 4> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PSCell, if any;
 - 4> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PSCell (e.g. periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PSCell;
- NOTE 2: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.

5.3.10.11 SCG dedicated resource configuration

- 1> if the received *radioResourceConfigDedicatedSCG* includes the *srb-ToReleaseListSCG*:
 - 2> for each *srb-Identity* value included in the *srb-ToReleaseListSCG* perform the SCG RLC bearer release as specified in 5.3.10.17;
- 1> if the received radioResourceConfigDedicatedSCG includes the srb-ToAddModListSCG:
 - 2> for each *srb-Identity* value included in the *srb-ToAddModListSCG* perform the SCG RLC bearer addition or reconfiguration as specified in 5.3.10.1a;
- 1> if the received *radioResourceConfigDedicatedSCG* includes *drb-ToReleaseListSCG*:
 - 2> perform the DRB release as specified in 5.3.10.2;
- 1> if the received *radioResourceConfigDedicatedSCG* includes the *drb-ToAddModListSCG*:
 - 2> if the UE is configured with NE-DC:
 - 3> for each *drb-Identity* value included in the *drb-ToAddModListSCG* perform the SCG RLC bearer addition or reconfiguration for DRBs in NE-DC as specified in 5.3.10.3a4;
 - 2> else:
 - 3> for each *drb-Identity* value included in the *drb-ToAddModListSCG* perform the DC specific DRB addition or reconfiguration as specified in 5.3.10.3a1;

- 1> if the received *radioResourceConfigDedicatedSCG* includes the *mac-MainConfigSCG*:
 - 2> perform the SCG MAC main reconfiguration as specified in 5.3.10.4;
- 1> if the received radioResourceConfigDedicatedSCG includes the rlf-TimersAndConstantsSCG:
 - 2> reconfigure the values of timers and constants as specified in 5.3.10.7;

5.3.10.12 Reconfiguration SCG or split DRB by *drb-ToAddModList*

The UE shall:

- 1> for each split or SCG DRBs that is part of the current configuration:
 - 2> if the corresponding *drb-Identity* value is included in the received *drb-ToAddModList*; and
 - 2> if the corresponding *drb-Identity* value is not included in the received *drb-ToAddModListSCG* (i.e. reconfigure split, split to MCG or SCG to MCG):
 - 3> perform the DC specific DRB addition or reconfiguration as specified in 5.3.10.3a1;

5.3.10.13 Neighbour cell information reconfiguration

The UE shall:

- 1> if the received *naics-Info* is set to *release*:
 - 2> instruct lower layer to release all the NAICS neighbour cell information for the concerned cell, if previously configured;
- 1> if the received *naics-Info* includes the *neighCellsToReleaseList-r12*:
 - 2> for each physCellId-r12 value included in the neighCellsToReleaseList-r12 that is part of the current NAICS neighbour cell information of the concerned cell:
 - 3> instruct lower layer to release the NAICS neighbour cell information for the concerned cell;
- 1> if the received *naics-Info* includes the *NeighCellsToAddModList-r12*:
 - 2> for each *physCellId-r12* value included in the *neighCellsToAddModList-r12* that is not part of the current NAICS neighbour cell information of the concerned cell:
 - 3> instruct lower layer to add the NAICS neighbour cell information for the concerned cell;
 - 2> for each physCellId-r12 value included in the neighCellsToAddModList-r12 that is part of the current NAICS neighbour cell information of the concerned cell:
 - 3> instruct lower layer to modify the NAICS neighbour cell information in accordance with the received *NeighCellsInfo* for the concerned cell;

5.3.10.14 Void

5.3.10.15 Sidelink dedicated configuration

- 1> if the *RRCConnectionReconfiguration* message includes the *sl-CommConfig*:
 - 2> if *commTxResources* is included and set to *setup*:
 - 3> from the next SC period use the resources indicated by *commTxResources* for sidelink communication transmission, as specified in 5.10.4;
 - 2> else if *commTxResources* is included and set to *release*:

- 3> from the next SC period, release the resources allocated for sidelink communication transmission previously configured by *commTxResources*;
- 1> if the RRCConnectionReconfiguration message includes the sl-DiscConfig:
 - 2> if *discTxResources* is included and set to *setup*:
 - 3> from the next discovery period, as defined by *discPeriod*, use the resources indicated by *discTxResources* for sidelink discovery announcement, as specified in 5.10.6;
 - 2> else if *discTxResources* is included and set to *release*:
 - 3> from the next discovery period, as defined by *discPeriod*, release the resources allocated for sidelink discovery announcement previously configured by *discTxResources*;
 - 2> if *discTxResourcesPS* is included and set to *setup*:
 - 3> from the next discovery period, as defined by *discPeriod*, use the resources indicated by *discTxResourcesPS* for sidelink discovery announcement, as specified in 5.10.6;
 - 2> else if *discTxResourcesPS* is included and set to *release*:
 - 3> from the next discovery period, as defined by *discPeriod*, release the resources allocated for sidelink discovery announcement previously configured by *discTxResourcesPS*;
 - 2> if *discTxInterFreqInfo* is included and set to *setup*:
 - 3> from the next discovery period, as defined by *discPeriod*, use the resources indicated by *discTxInterFreqInfo* for sidelink discovery announcement, as specified in 5.10.6;
 - 2> else if *discTxInterFreqInfo* is included and set to *release*:
 - 3> from the next discovery period, as defined by *discPeriod*, release the resources allocated for sidelink discovery announcement previously configured by *discTxInterFreqInfo*;
 - 2> if *discRxGapConfig* is included and set to *setup*:
 - 3> from the next gap period, as defined by gapPeriod, use the gaps indicated by discRxGapConfig for sidelink discovery monitoring, as specified in 5.10.5;
 - 2> else if *discRxGapConfig* is included and set to *release*:
 - 3> from the next gap period, as defined by gapPeriod, release the gaps configured for sidelink discovery monitoring previously configured by discRxGapConfig;
 - 2> if *discTxGapConfig* is included and set to *setup*:
 - 3> from the next gap period, as defined by gapPeriod, use the gaps indicated by discTxGapConfig for sidelink discovery announcement, as specified in 5.10.6;
 - 2> else if *discTxGapConfig* is included and set to *release*:
 - 3> from the next gap period, as defined by gapPeriod, release the gaps configured for sidelink discovery announcement previously configured by discTxGapConfig;
 - 2> if *discSysInfoToReportConfig* is included and set to *setup*:
 - 3> start timer T370 with the timer value set to 60s;
 - 2> else if *discSysInfoToReportConfig* is included and set to *release*:
 - 3> stop timer T370 and release *discSysInfoToReportConfig*;

5.3.10.15a V2X sidelink Communication dedicated configuration

- 1> if the *RRCConnectionReconfiguration* message includes the *sl-V2X-ConfigDedicated*:
 - 2> if *commTxResources* is included and set to *setup*:
 - 3> use the resources indicated by *commTxResources* for V2X sidelink communication transmission, as specified in 5.10.13;
 - 3> perform CBR measurement on the transmission resource pool indicated in *commTxResources* for V2X sidelink communication transmission, as specified in 5.5.3;
 - 2> else if *commTxResources* is included and set to *release*:
 - 3> release the resources allocated for V2X sidelink communication transmission previously configured by commTxResources;
 - 2> if v2x-InterFreqInfoList is included:
 - 3> use the synchronization configuration and resource configuration parameters for V2X sidelink communication on frequencies included in *v2x-InterFreqInfoList*, as specified in 5.10.13;
 - 3> perform CBR measurement on the transmission resource pool indicated in v2x-InterFreqInfoList for V2X sidelink communication transmission, as specified in 5.5.3;
- 1> if the *RRCConnectionReconfiguration* message includes the *mobilityControlInfoV2X*:
 - 2> if v2x-CommRxPool is included:
 - 3> use the resources indicated by v2x-CommRxPool for V2X sidelink communication reception, as specified in 5.10.12;
 - 2> if v2x-CommTxPoolExceptional is included:
 - 3> use the resources indicated by v2x-CommTxPoolExceptional for V2X sidelink communication transmission, as specified in 5.10.13;
 - 3> perform CBR measurement on the transmission resource pool indicated by *v2x-CommTxPoolExceptional* for V2X sidelink communication transmission, as specified in 5.5.3;

5.3.10.16 T370 expiry

The UE shall:

1> if T370 expires:

2> release discSysInfoToReportConfig;

5.3.10.17 SRB release

- 1> for each *srb-Identity* value included in *srb-ToReleaseList* or in *srb-ToReleaseListSCG* that is part of the current UE configuration:
 - 2> if the SRB configuration does not include an E-UTRA PDCP entity (release the SCG RLC bearer configuration):
 - 3> re-establish the RLC entity as specified in TS 36.322 [7] for this SRB;
 - 3> configure the E-UTRA PDCP entity to deactivate duplication;
 - 2> release the RLC entity or entities;
 - 2> release the DCCH logical channel;
 - 2> if *srb-Identity* value is set to 4, release the PDCP entity;

5.3.10.18 Scheduling Request Configuration for NB-IoT

The UE shall:

- 1> apply *sr*-*WithHARQ-ACK-Config*, if included;
- 1> apply *sr-WithoutHARQ-ACK-Config*, if included;
- 1> apply sr-SPS-BSR-Config, if included;

5.3.10.19 NE-DC release

The UE shall:

- 1> if NE-DC release is triggered by NR:
 - 2> reset SCG MAC, if configured;
 - 2> for each RLC bearer that is part of the SCG configuration:
 - 3> perform RLC bearer release procedure as specified in 5.3.10.17 (SRBs) and in 5.3.10.2 (DRBs);
 - 2> release the measurement configuration;
 - 2> release the SCG configuration i.e. release the MAC and physical configuration for each cell that is part of the SCG configuration;
 - 2> stop timer T313 for the corresponding PSCell, if running;
 - 2> stop timer T307 for the corresponding PSCell, if running.
- NOTE: Upon NE-DC release the UE releases all fields configured by the *RRCConnectionReconfiguration* message.

5.3.11 Radio link failure related actions

5.3.11.1 Detection of physical layer problems in RRC_CONNECTED

The UE shall:

- 1> upon receiving N310 consecutive "out-of-sync" indications for the PCell from lower layers while neither T300, T301, T304 nor T311 is running:
 - 2> start timer T310;
- 1> upon receiving N313 consecutive "out-of-sync" indications for the PSCell from lower layers while T307 is not running:

2> start T313;

NOTE: Physical layer monitoring and related autonomous actions do not apply to SCells except for the PSCell.

5.3.11.1a Early detection of physical layer problems in RRC_CONNECTED

The UE shall:

1> upon receiving N310 consecutive "early-out-of-sync" indications for the PCell from lower layers:

2> start timer T314 with the timer value set to the value of T310;

5.3.11.1b Detection of physical layer improvements in RRC_CONNECTED

1> upon receiving N311 consecutive "early-in-sync" indications for the PCell from lower layers:

2> start timer T315 with the timer value set to the value of T310;

5.3.11.2 Recovery of physical layer problems

Upon receiving N311 consecutive "in-sync" indications for the PCell from lower layers while T310 is running, the UE shall:

1> stop timer T310;

1> stop timer T312, if running;

- NOTE 1: In this case, the UE maintains the RRC connection without explicit signalling, i.e. the UE maintains the entire radio resource configuration.
- NOTE 2: Periods in time where neither "in-sync" nor "out-of-sync" is reported by layer 1 do not affect the evaluation of the number of consecutive "in-sync" or "out-of-sync" indications.

Upon receiving N314 consecutive "in-sync" indications for the PSCell from lower layers while T313 is running, the UE shall:

1> stop timer T313;

5.3.11.2a Recovery of early detection of physical layer problems

Upon receiving N311 consecutive "in-sync" indications for the PCell from lower layers while T314 is running, the UE shall:

1> stop timer T314;

5.3.11.2b Cancellation of physical layer improvements in RRC_CONNECTED

Upon receiving N311 consecutive "in-sync" indications for the PCell from lower layers while T315 is running, the UE shall:

1> stop timer T315;

5.3.11.3 Detection of radio link failure

- 1> upon T310 expiry; or
- 1> upon T312 expiry; or
- 1> upon random access problem indication from MCG MAC while neither T300, T301, T304 nor T311 is running; or
- 1> upon indication from MCG RLC, which is allowed to be send on PCell, that the maximum number of retransmissions has been reached for an SRB or DRB:
 - 2> consider radio link failure to be detected for the MCG i.e. RLF;
 - 2> except for NB-IoT, store the following radio link failure information in the *VarRLF-Report* by setting its fields as follows:
 - 3> clear the information included in VarRLF-Report, if any;
 - 3> set the *plmn-IdentityList* to include the list of EPLMNs stored by the UE (i.e. includes the RPLMN);
 - 3> set the *measResultLastServCell* to include the RSRP and RSRQ, if available, of the PCell based on measurements collected up to the moment the UE detected radio link failure;

- 3> set the *measResultNeighCells* to include the best measured cells, other than the PCell, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected radio link failure, and set its fields as follows;
 - 4> if the UE was configured to perform measurements for one or more EUTRA frequencies, include the measResultListEUTRA;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring UTRA frequencies, include the *measResultListUTRA*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring GERAN frequencies, include the *measResultListGERAN*;
 - 4> if the UE was configured to perform measurement reporting for one or more neighbouring CDMA2000 frequencies, include the *measResultsCDMA2000*;
 - 4> for each neighbour cell included, include the optional fields that are available;
- NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.
 - 3> if available, set the *logMeasResultListWLAN* to include the WLAN measurement results, in order of decreasing RSSI for WLAN APs;
 - 3> if available, set the *logMeasResultListBT* to include the Bluetooth measurement results, in order of decreasing RSSI for Bluetooth beacons;
 - 3> if detailed location information is available, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 4> include the *horizontalVelocity*, if available;
 - 3> set the *failedPCellId* to the global cell identity, if available, and otherwise to the physical cell identity and carrier frequency of the PCell where radio link failure is detected;
 - 3> set the *tac-FailedPCell* to the tracking area code, if available, of the PCell where radio link failure is detected;
 - 3> if an *RRCConnectionReconfiguration* message including the *mobilityControlInfo* was received before the connection failure:
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned an intra E-UTRA handover:
 - 5> include the *previousPCellId* and set it to the global cell identity of the PCell where the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
 - 4> if the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo* concerned a handover to E-UTRA from UTRA and if the UE supports Radio Link Failure Report for Inter-RAT MRO:
 - 5> include the *previousUTRA-CellId* and set it to the physical cell identity, the carrier frequency and the global cell identity, if available, of the UTRA Cell in which the last *RRCConnectionReconfiguration* message including *mobilityControlInfo* was received;
 - 5> set the *timeConnFailure* to the elapsed time since reception of the last *RRCConnectionReconfiguration* message including the *mobilityControlInfo*;
 - 3> if the UE supports QCI1 indication in Radio Link Failure Report and has a DRB for which QCI is 1:
 - 4> include the *drb-EstablishedWithQCI-1*;

- 3> set the *connectionFailureType* to *rlf*;
- 3> set the *c*-*RNTI* to the C-RNTI used in the PCell;
- 3> set the *rlf-Cause* to the trigger for detecting radio link failure;
- 2> if AS security has not been activated:
 - 3> if the UE is a NB-IoT UE:
 - 4> if the UE supports RRC connection re-establishment for the Control Plane CIoT EPS optimisation:
 - 5> initiate the RRC connection re-establishment procedure as specified in 5.3.7;

4> else:

- 5> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'RRC connection failure';
- 3> else:
 - 4> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';

2> else:

3> initiate the connection re-establishment procedure as specified in 5.3.7;

In case of DC or NE-DC, the UE shall:

1> upon T313 expiry; or

- 1> upon random access problem indication from SCG MAC; or
- 1> upon indication from SCG RLC, which is allowed to be sent on PSCell, that the maximum number of retransmissions has been reached for an SCG, for a split DRB or for a split SRB:
 - 2> consider radio link failure to be detected for the SCG i.e. SCG-RLF;
 - 2> initiate the SCG failure information procedure as specified in 5.6.13 to report SCG radio link failure;

In case of CA PDCP duplication, the UE shall:

- 1> upon indication from an RLC entity, which is restricted to be sent on SCell only, that the maximum number of retransmissions has been reached:
 - 2> initiate the failure information procedure as specified in 5.6.21 to report RLC failure of type duplication;

The UE may discard the radio link failure information, i.e. release the UE variable *VarRLF-Report*, 48 hours after the radio link failure is detected, upon power off or upon detach.

5.3.11.3a Detection of early-out-of-sync event

The UE shall:

- 1> upon T314 expiry;
 - 2> consider "early-out-of-sync" event to be detected and initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10;

5.3.11.3b Detection of early-in-sync event

The UE shall:

1> upon T315 expiry;

2> consider "early-in-sync" event to be detected and initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10;

5.3.12 UE actions upon leaving RRC_CONNECTED or RRC_INACTIVE

Upon leaving RRC_CONNECTED or RRC_INACTIVE, the UE shall:

1> reset MAC;

1> if leaving RRC_INACTIVE was not triggered by the reception of *RRCConnectionRelease* including *idleModeMobilityControlInfo*:

2> stop the timer T320, if running;

- 2> if stored, discard the cell reselection priority information provided by the *idleModeMobilityControlInfo*;
- 1> if entering RRC_IDLE was triggered by reception of the *RRCConnectionRelease* message including a *waitTime*:
 - 2> start timer T302, with the timer value set according to the *waitTime*;
 - 2> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2';
- 1> else if T302 is running:
 - 2> stop timer T302;
 - 2> if the UE is connected to 5GC:
 - 3> perform the actions as specified in 5.3.16.4;
- 1> if T309 is running:
 - 2> stop timer T309 for all access categories;
 - 2> perform the actions as specified in 5.3.16.4.
- 1> stop all timers that are running except T302, T320, T322, T325, T330, T331;
- 1> if leaving RRC_CONNECTED was triggered by suspension of the RRC:
 - 2> re-establish RLC entities for all SRBs and DRBs, including RBs configured with NR PDCP;
 - 2> store the UE AS Context including the current RRC configuration, the current security context, the PDCP state including ROHC state, C-RNTI used in the source PCell, the *cellIdentity* and the physical cell identity of the source PCell;
 - 2> store the following information provided by E-UTRAN:
 - 3> the *resumeIdentity*;
 - 3> the nextHopChainingCount, if present. Otherwise discard any stored nextHopChainingCount that does not correspond to stored key K_{RRCint};
 - 3> the *drb-ContinueROHC*, if present. Otherwise discard any stored *drb-ContinueROHC*;
 - 2> suspend all SRB(s) and DRB(s), including RBs configured with NR PDCP, except SRB0;
 - 2> indicate the suspension of the RRC connection to upper layers;
 - 2> configure lower layers to suspend integrity protection and ciphering;
- NOTE 1: Except for UP-EDT, ciphering is not applied for the subsequent *RRCConnectionResume* message used to resume the connection and an integrity check is performed by lower layers, but merely upon request from RRC.

2> upon leaving RRC_INACTIVE:

- 3> discard the UE Inactive AS context;
- 3> discard the KeNB, the KRRCenc key, the KRRCint and the KUPenc key;
- 2> release the *rrc-InactiveConfig*, if configured;
- 2> release all radio resources, including release of the MAC configuration, the RLC entity and the associated PDCP entity and SDAP (if any) for all established RBs;
- 2> indicate the release of the RRC connection to upper layers together with the release cause;
- 1> if leaving RRC_CONNECTED was triggered neither by reception of the *MobilityFromEUTRACommand* message nor by selecting an inter-RAT cell while T311 was running; or
- 1> if leaving RRC_INACTIVE was not triggered by the inter-RAT cell reselection:
 - 2> if timer T350 is configured:
 - 3> start timer T350;
 - 3> apply rclwi-Configuration if configured, otherwise apply the wlan-Id-List corresponding to the RPLMN included in SystemInformationBlockType17;

2> else:

- 3> release the *wlan-OffloadConfigDedicated*, if received;
- 3> if the wlan-OffloadConfigCommon corresponding to the RPLMN is broadcast by the cell:
 - 4> apply the wlan-OffloadConfigCommon corresponding to the RPLMN included in SystemInformationBlockType17;
 - 4> apply steerToWLAN if configured, otherwise apply the wlan-Id-List corresponding to the RPLMN included in SystemInformationBlockType17;
- 2> enter RRC_IDLE and perform procedures as specified in TS 36.304 [4], clause 5.2.7;

1> else:

- 2> release the *wlan-OffloadConfigDedicated*, if received;
- NOTE 2: BL UEs or UEs in CE verifies validity of SI when released to RRC_IDLE.
- 1> release the LWA configuration, if configured, as described in 5.6.14.3;
- 1> release the LWIP configuration, if configured, as described in 5.6.17.3;

5.3.13 UE actions upon PUCCH/ SPUCCH/ SRS release request

Upon receiving a PUCCH release request from lower layers, for an indicated serving cell the UE shall:

- 1> apply the default physical channel configuration for *cqi-ReportConfig* for the indicated serving cell as specified in 9.2.4 and release *cqi-ReportConfigSCell*, for each SCell that sends HARQ feedback on the indicated serving cell, if any;
- 1> apply the default physical channel configuration for *schedulingRequestConfig* as specified in 9.2.4, for the concerned CG;

Upon receiving a sPUCCH release request from lower layers, the UE shall:

1> for each serving cell in the UE configuration:

2> apply the value *release* to the field *schedulingRequest-SPUCCH*;

Upon receiving an SRS release request from lower layers, for an indicated serving cell the UE shall:

1> apply the default physical channel configuration for *soundingRS-UL-ConfigDedicated*, as specified in 9.2.4;

NOTE: Upon PUCCH/ SRS release request, the UE does not modify the *soundingRS-UL-ConfigDedicatedAperiodic* i.e. it does not apply the default for this field (release).

5.3.13a UE actions upon SR release request for NB-IoT

Upon receiving a SR release request from lower layers, the UE shall:

- 1> apply the value FALSE for sr-WithHARQ-ACK-Config and release sr-WithHARQ-ACK-Config, if configured;
- 1> apply the value *release* for *sr-WithoutHARQ-ACK-Config* and release *sr-WithoutHARQ-ACK-Config*, if configured;
- 1> apply the value *release* for *sr-SPS-BSR-Config* and release *sr-SPS-BSR-Config*, if configured;

5.3.14 Proximity indication

5.3.14.1 General

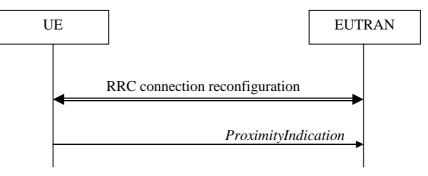


Figure 5.3.14.1-1: Proximity indication

The purpose of this procedure is to indicate that the UE is entering or leaving the proximity of one or more CSG member cells. The detection of proximity is based on an autonomous search function as defined in TS 36.304 [4].

5.3.14.2 Initiation

A UE in RRC_CONNECTED shall:

- 1> if the UE enters the proximity of one or more CSG member cell(s) on an E-UTRA frequency while proximity indication is enabled for such E-UTRA cells; or
- 1> if the UE enters the proximity of one or more CSG member cell(s) on an UTRA frequency while proximity indication is enabled for such UTRA cells; or
- 1> if the UE leaves the proximity of all CSG member cell(s) on an E-UTRA frequency while proximity indication is enabled for such E-UTRA cells; or
- 1> if the UE leaves the proximity of all CSG member cell(s) on an UTRA frequency while proximity indication is enabled for such UTRA cells:
 - 2> if the UE has previously not transmitted a *ProximityIndication* for the RAT and frequency during the current RRC connection, or if more than 5 s has elapsed since the UE has last transmitted a *ProximityIndication* (either entering or leaving) for the RAT and frequency:
 - 3> initiate transmission of the *ProximityIndication* message in accordance with 5.3.14.3;
- NOTE: In the conditions above, "if the UE enters the proximity of one or more CSG member cell(s)" includes the case of already being in the proximity of such cell(s) at the time proximity indication for the corresponding RAT is enabled.

5.3.14.3 Actions related to transmission of *ProximityIndication* message

The UE shall set the contents of *ProximityIndication* message as follows:

- 1> if the UE applies the procedure to report entering the proximity of CSG member cell(s):
 - 2> set *type* to *entering*;
- 1> else if the UE applies the procedure to report leaving the proximity of CSG member cell(s):

2> set *type* to *leaving*;

- 1> if the proximity indication was triggered for one or more CSG member cell(s) on an E-UTRA frequency:
 - 2> set the *carrierFreq* to *eutra* with the value set to the E-ARFCN value of the E-UTRA cell(s) for which proximity indication was triggered;
- 1> else if the proximity indication was triggered for one or more CSG member cell(s) on a UTRA frequency:
 - 2> set the *carrierFreq* to *utra* with the value set to the ARFCN value of the UTRA cell(s) for which proximity indication was triggered;

The UE shall submit the ProximityIndication message to lower layers for transmission.

5.3.15 Void

5.3.16 Unified Access Control

5.3.16.1 General

The purpose of this procedure is to perform access barring check for an access attempt associated with a given Access Category and one or more Access Identities upon request from upper layers according to TS 24.501 [95] or the RRC layer.

After a handover resulting in change of PCell in RRC_CONNECTED the UE shall defer access barring checks until it has obtained valid UAC information (from *SystemInformationBlockType25*) from the target cell if the *SystemInformationBlockType25* is broadcasted.

5.3.16.2 Initiation

Upon initiation of the procedure, the UE shall:

1> if T309 is running for the Access Category:

2> consider the access attempt as barred;

1> else if timer T302 is running and the Access Category is neither '2' nor '0':

2> consider the access attempt as barred;

1> else:

2> if the Access Category is '0':

3> consider the access attempt as allowed;

2> else if *SystemInformationBlockType25* is not broadcasted:

3> consider the access attempt as allowed;

- 3> if *SystemInformationBlockType25* includes *uac-BarringPerPLMN-List* and the *uac-BarringPerPLMN-List* contains an *UAC-BarringPerPLMN* entry with the *plmn-IdentityIndex* corresponding to the PLMN selected by upper layers (see TS 24.501 [95]):
 - 4> select the UAC-BarringPerPLMN entry with the plmn-IdentityIndex corresponding to the PLMN selected by upper layers;
 - 4> in the remainder of this procedure, use the selected UAC-BarringPerPLMN entry (i.e. presence or absence of access barring parameters in this entry) irrespective of the uac-BarringForCommon included in SystemInformationBlockType25;
- 3> else if SystemInformationBlockType25 includes uac-BarringForCommon:
 - 4> in the remainder of this procedure use the *uac-BarringForCommon* (i.e. presence or absence of these parameters) included in *SystemInformationBlockType25*;
- 3> else:
 - 4> consider the access attempt as allowed;
- 3> if *uac-BarringForCommon* is applicable or the *uac-AC-BarringListType* indicated that *uac-ExplicitAC-BarringList* is used:
 - 4> if the corresponding *UAC-BarringPerCatList* contains a *UAC-BarringPerCat* entry corresponding to the Access Category:
 - 5> select the UAC-BarringPerCat entry;
 - 5> if the uac-BarringInfoSetList contain a UAC-BarringInfoSet entry corresponding to the uacbarringInfoSetIndex in the UAC-BarringPerCat:

6> select the UAC-BarringInfoSet entry;

- 6> perform access barring check for the Access Category as specified in 5.3.16.5, using the UAC-BarringInfoSet as "UAC barring parameter";
- 5> else:

6> consider the access attempt as allowed;

4> else:

5> consider the access attempt as allowed;

- 3> else if the *uac-AC-BarringListType* indicated that *uac-ImplicitAC-BarringList* is indicated:
 - 4> select the uac-BarringInfoSetIndex corresponding to the Access Category in the uac-ImplicitACBarringList;
 - 4> if the uac-BarringInfoSetList contain the UAC-BarringInfoSet entry corresponding to the selected uac-BarringInfoSetIndex:
 - 5> select the UAC-BarringInfoSet entry;
 - 5> perform access barring check for the Access Category as specified in 5.3.16.5, using the UAC-BarringInfoSet as "UAC barring parameter";
 - 4> else:

5> consider the access attempt as allowed;

3> else:

4> consider the access attempt as allowed;

1> if the access barring check was requested by upper layers:

2> if the access attempt is considered as barred:

- 3> if timer T302 is running:
 - 4> if timer T309 is running for Access Category '2':
 - 5> inform the upper layer that access barring is applicable for all access categories except categories '0', upon which the procedure ends;

4> else:

5> inform the upper layer that access barring is applicable for all access categories except categories '0' and '2', upon which the procedure ends;

3> else:

4> inform upper layers that the access attempt for the Access Category is barred, upon which the procedure ends;

2> else:

3> inform upper layers that the access attempt for the Access Category is allowed, upon which the procedure ends;

1> else:

2> the procedure ends;

5.3.16.3 Void

5.3.16.4 T302, T309 expiry or stop (Barring alleviation)

If the UE is connected to 5GC, the UE shall:

1> if timer T302 expires or is stopped:

2> for each Access Category for which T309 is not running:

3> consider the barring for this Access Category to be alleviated:

1> else if timer T309 corresponding to an Access Category other than '2' expires or is stopped, and if timer T302 is not running:

2> consider the barring for this Access Category to be alleviated;

1> else if timer T309 corresponding to the Access Category '2' expires or is stopped:

2> consider the barring for this Access Category to be alleviated;

- 1> When barring for an access category is considered being alleviated:
 - 2> if the Access Category was informed to upper layers as barred:
 - 3> inform upper layers about barring alleviation for the Access Category;
 - 2> if barring is alleviated for Access Category '8':

3> perform actions specified in 5.3.17;

5.3.16.5 Access barring check

The UE shall:

1> if one or more Access Identities are indicated according to TS 24.501 [95], and

1> if for at least one of these Access Identities the corresponding bit in the *uac-BarringForAccessIdentity* contained in "UAC barring parameter" is set to *zero*:

2> consider the access attempt as allowed;

1> else:

- 2> draw a random number '*rand*' uniformly distributed in the range: $0 \le rand < 1$;
- 2> if 'rand' is lower than the value indicated by uac-BarringFactor included in "UAC barring parameter":

3> consider the access attempt as allowed;

2> else:

3> consider the access attempt as barred;

- 1> if the access attempt is considered as barred:
 - 2> draw a random number '*rand*' that is uniformly distributed in the range $0 \le rand < 1$;
 - 2> start timer T309 for the Access Category with the timer value calculated as follows, using the *uac-BarringTime* included in "AC barring parameter":

"Tbarring" = (0.7+ 0.6 * *rand*) * *uac-BarringTime*;

5.3.17 RAN notification area update

5.3.17.1 General

The purpose of this procedure is:

- to notify the network that a UE in RRC_INACTIVE has re-selected to a cell not belonging to the configured RAN notification area; or
- to periodically notify the network by a UE in RRC_INACTIVE;

5.3.17.2 Initiation

When in RRC_INACTIVE state, the UE shall:

- 1> if T380 expires, or:
- 1> if RNA Update is triggered at reception of *SystemInformationBlockType1*, as specified in 5.2.2.7:
 - 2> initiate RRC connection resume procedure in 5.3.3 with cause value set to 'rna-Update';
- 1> if barring is alleviated for Access Category '8', as specified in 5.3.16.4:
 - 2> if upper layers do not request RRC the resumption of an RRC connection, and
 - 2> if the variable *pendingRnaUpdate* is set to 'TRUE':
 - 3> initiate RRC connection resume procedure in 5.3.3 with cause value set to 'rna-Update';

If the UE in RRC_INACTIVE state fails to find a suitable cell and camps on the acceptable cell to obtain limited service as defined in TS 36.304 [4], the UE shall:

1> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12 with release cause 'other'.

5.3.17.3 Inter RAT cell reselection or CN type change

Upon reselecting to an inter-RAT cell or to another CN type, the UE shall:

1> perform the actions upon leaving RRC_INACTIVE as specified in 5.3.12, with release cause 'other'.

5.4 Inter-RAT mobility

5.4.1 Introduction

The general principles of connected mode mobility are described in 5.3.1.3. The general principles of the security handling upon connected mode mobility are described in 5.3.1.2.

For the (network controlled) inter RAT mobility from E-UTRA for a UE in RRC_CONNECTED, a single procedure is defined that supports both handover, cell change order with optional network assistance (NACC) and enhanced CS fallback to CDMA2000 1xRTT. The same procedure also supports inter-system handover between E-UTRA/EPC and E-UTRA/5GC. In case of mobility to CDMA2000, the eNB decides when to move to the other RAT while the target RAT determines to which cell the UE shall move.

5.4.2 Handover to E-UTRA

5.4.2.1 General

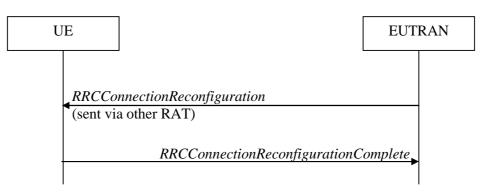


Figure 5.4.2.1-1: Handover to E-UTRA, successful

The purpose of this procedure is to, under the control of the network, transfer a connection between the UE and another Radio Access Network (e.g. GERAN, UTRAN or NR) to E-UTRAN, or transfer a connection between the UE and the E-UTRAN with one type of CN to the E-UTRAN with a different type of CN.

The handover to E-UTRA procedure applies when SRBs, possibly in combination with DRBs, are established in another RAT or in E-UTRA connected to another type of CN. Handover from UTRAN to E-UTRAN applies only after integrity has been activated in UTRAN. Handover to E-UTRA connected to a different type of CN applies only after integrity has been activated in E-UTRAN. Handover from NR to E-UTRAN applies only after integrity has been activated in RAT.

5.4.2.2 Initiation

The RAN using another RAT or the E-UTRA connected to a different type of CN initiates the handover to E-UTRA procedure, in accordance with the specifications applicable for the other RAT or for the E-UTRA connected to a different type of CN, by sending the *RRCConnectionReconfiguration* message via the radio access technology from which the inter-RAT handover is performed.

E-UTRAN applies the procedure as follows:

- to activate ciphering, possibly using NULL algorithm, if not yet activated in the other RAT or in the E-UTRA connected to a different type of CN;
- to establish SRB1, SRB2 and one or more DRBs, i.e. at least the DRB associated with the default EPS bearer is established if the target CN is EPC and at least one DRB is established if the target CN is 5GC.

5.4.2.3 Reception of the *RRCConnectionReconfiguration* by the UE

If the UE is able to comply with the configuration included in the *RRCConnectionReconfiguration* message, the UE shall:

- 1> if the *RRCConnectionReconfiguration* message does not include the *fullConfig* and the UE is connected to 5GC (i.e., delta signalling during intra 5GC handover):
 - 2> re-use the source SDAP and PDCP configurations (i.e., current SDAP/PDCP configurations for all RBs from source RAT prior to the reception of the inter-RAT handover *RRCConnectionReconfiguration* message);
- 1> if the *RRCConnectionReconfiguration* message includes the *fullConfig* and the source RAT was E-UTRA (i.e., intra-RAT inter-system handover):
 - 2> except the MCG C-RNTI, release/ clear all current dedicated radio resources and configurations, including all SDAP (if configured), PDCP, RLC, logical channel configurations for the DRBs and the logged measurement configuration (if configured);
 - 2> release/ clear all current common radio configurations;
 - 2> for each *srb-Identity* value included in the *srb-ToAddModList* (SRB reconfiguration):
 - 3> apply the specified configuration defined in 9.1.2 for the corresponding SRB;
 - 3> apply the corresponding default RLC configuration for the SRB specified in 9.2.1.1 for SRB1 or in 9.2.1.2 for SRB2;
 - 3> apply the corresponding default logical channel configuration for the SRB as specified in 9.2.1.1 for SRB1 or in 9.2.1.2 for SRB2;
 - 3> if the *handoverType* in *securityConfigHO* is set to *fivegc-ToEPC* (i.e, the UE is connecting to EPC):

4> release the PDCP entity and establish it with an E-UTRA PDCP entity;

- 3> else if the handoverType in securityConfigHO is set to epc-To5GC (i.e., the UE is connecting to 5GC):
 - 4> release the PDCP entity and establish it with an NR PDCP and apply the corresponding default PDCP configuration for the SRB as specified in TS 38.331 [82], clause 9.2.1;

3> associate the RLC bearer of this SRB with the established PDCP entity;

- 1> apply the default physical channel configuration as specified in 9.2.4;
- 1> apply the default semi-persistent scheduling configuration as specified in 9.2.3;
- 1> apply the default MAC main configuration as specified in 9.2.2;
- 1> start timer T304 with the timer value set to t304, as included in the mobilityControlInfo;
- 1> consider the target PCell to be one on the frequency indicated by the *carrierFreq* with a physical cell identity indicated by the *targetPhysCellId*;
- 1> start synchronising to the DL of the target PCell;
- 1> set the C-RNTI to the value of the *newUE-Identity*;
- 1> for the target PCell, apply the downlink bandwidth indicated by the *dl-Bandwidth*;
- 1> for the target PCell, apply the uplink bandwidth indicated by (the absence or presence of) the *ul-Bandwidth;*
- 1> configure lower layers in accordance with the received *radioResourceConfigCommon*;
- 1> configure lower layers in accordance with any additional fields, not covered in the previous, if included in the received *mobilityControlInfo*;
- 1> perform the radio resource configuration procedure as specified in 5.3.10;
- 1> if the handoverType in securityConfigHO is set to fivegc-ToEPC:
 - 2> indicate to higher layer that the CN has changed from 5GC to EPC;
 - 2> derive the key K_{eNB} based on the mapped K_{ASME} key as specified for interworking between EPS and 5GS in TS 33.501 [86];

2> store the *nextHopChainingCount-r15* value;

1> else if the handoverType in securityConfigHO is set to intra5GC:

2> if the keyChangeIndicator-r15 received in the securityConfigHO is set to TRUE:

3> forward *nas-Container* to the upper layers, if included;

3> update the K_{eNB} key based on the K_{AMF} key, as specified in TS 33.501 [86];

2> else:

3> update the K_{eNB} key based on the current K_{gNB} or the NH, using the *nextHopChainingCount-r15* value indicated in the *SecurityConfigHO*, as specified in TS 33.501 [86];

2> store the *nextHopChainingCount-r15* value;

1> else if the handoverType in securityConfigHO is set to epc-To5GC:

2> forward the *nas-Container* to the upper layers

2> derive the K_{eNB} key, as specified in TS 33.501 [86];

1> else:

2> forward the *nas-SecurityParamToEUTRA* to the upper layers;

2> derive the K_{eNB} key, as specified in TS 33.401 [32];

1> derive the K_{RRCint} key associated with the *integrityProtAlgorithm*, as specified in TS 33.401 [32];

1> derive the K_{RRCenc} key and the K_{UPenc} key associated with the *cipheringAlgorithm*, as specified in TS 33.401 [32];

1> if the received RRCConnectionReconfiguration includes the nr-RadioBearerConfig1:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6;

1> if the received RRCConnectionReconfiguration includes the nr-RadioBearerConfig2:

2> perform radio bearer configuration as specified in TS 38.331 [82], clause 5.3.5.6.

1> if the handoverType in securityConfigHO is set to fivegc-ToEPC or if the handoverType-v1530 is not present:

- 2> configure lower layers to apply the indicated integrity protection algorithm and the K_{RRCint} key immediately, i.e. the indicated integrity protection configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;
- 2> configure lower layers to apply the indicated ciphering algorithm, the K_{RRCenc} key and the K_{UPenc} key immediately, i.e. the indicated ciphering configuration shall be applied to all subsequent messages received and sent by the UE, including the message used to indicate the successful completion of the procedure;

1> if the received *RRCConnectionReconfiguration* includes the s*CellToAddModList*:

2> perform SCell addition as specified in 5.3.10.3b;

1> if the *RRCConnectionReconfiguration* message includes the *measConfig*:

2> perform the measurement configuration procedure as specified in 5.5.2;

- 1> perform the measurement identity autonomous removal as specified in 5.5.2.2a;
- 1> if the *RRCConnectionReconfiguration* message includes the *otherConfig*:

2> perform the other configuration procedure as specified in 5.3.10.9;

1> if the *RRCConnectionReconfiguration* message includes *wlan-OffloadInfo*:

2> perform the dedicated WLAN offload configuration procedure as specified in 5.6.12.2;

1> if the RRCConnectionReconfiguration message includes rclwi-Configuration:

2> perform the WLAN traffic steering command procedure as specified in 5.6.16.2;

1> if the *RRCConnectionReconfiguration* message includes *lwa-Configuration*:

2> perform the LWA configuration procedure as specified in 5.6.14.2;

1> if the *RRCConnectionReconfiguration* message includes *lwip-Configuration*:

2> perform the LWIP reconfiguration procedure as specified in 5.6.17.2;

- 1> set the content of *RRCConnectionReconfigurationComplete* message as follows:
 - 2> if the UE has radio link failure or handover failure information available in VarRLF-Report and if the RPLMN is included in plmn-IdentityList stored in VarRLF-Report:

3> include *rlf-InfoAvailable*;

2> if the UE has MBSFN logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and if T330 is not running:

3> include logMeasAvailableMBSFN;

2> else if the UE has logged measurements available for E-UTRA and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailable*;

2> if the UE has Bluetooth logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailableBT*;

2> if the UE has WLAN logged measurements available and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*:

3> include the *logMeasAvailableWLAN*;

2> if the UE has connection establishment failure information available in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:

3> include connEstFailInfoAvailable;

- 1> submit the *RRCConnectionReconfigurationComplete* message to lower layers for transmission using the new configuration;
- 1> if the RRCConnectionReconfiguration message does not include rlf-TimersAndConstants set to setup:

2> use the default values specified in 9.2.5 for timer T310, T311 and constant N310, N311;

1> if MAC successfully completes the random access procedure:

2> stop timer T304;

- 2> apply the parts of the CQI reporting configuration, the scheduling request configuration and the sounding RS configuration that do not require the UE to know the SFN of the target PCell, if any;
- 2> apply the parts of the measurement and the radio resource configuration that require the UE to know the SFN of the target PCell (e.g. measurement gaps, periodic CQI reporting, scheduling request configuration, sounding RS configuration), if any, upon acquiring the SFN of the target PCell;
- NOTE 1: Whenever the UE shall setup or reconfigure a configuration in accordance with a field that is received it applies the new configuration, except for the cases addressed by the above statements.

2> enter E-UTRA RRC_CONNECTED, upon which the procedure ends;

- NOTE 2: The UE is not required to determine the SFN of the target PCell by acquiring system information from that cell before performing RACH access in the target PCell.
- NOTE 3: If the handover is from NR and target CN is 5GC, the delta configuration on PDCP and SDAP can be used for intra-system inter-RAT handover. For other cases, source RAT configuration is not considered when the UE applies the reconfiguration message of target RAT.

5.4.2.4 Reconfiguration failure

The UE shall:

- 1> if the UE is unable to comply with (part of) the configuration included in the *RRCConnectionReconfiguration* message:
 - 2> if the source RAT is E-UTRA:
 - 3> perform the actions as specified in 5.3.5.5;

2> else:

- 3> perform the actions defined for this failure case as defined in the specifications applicable for the other RAT;
- NOTE 1: The UE may apply above failure handling also in case the *RRCConnectionReconfiguration* message causes a protocol error for which the generic error handling as defined in 5.7 specifies that the UE shall ignore the message.
- NOTE 2: If the UE is unable to comply with part of the configuration, it does not apply any part of the configuration, i.e. there is no partial success/ failure.

5.4.2.5 T304 expiry (handover to E-UTRA failure)

The UE shall:

- 1> upon T304 expiry (handover to E-UTRA failure):
 - 2> if the source RAT is E-UTRA:

3> perform the actions as specified in 5.3.5.6;

2> else:

3> reset MAC;

3> perform the actions defined for this failure case as defined in the specifications applicable for the other RAT;

5.4.3 Mobility from E-UTRA

5.4.3.1 General

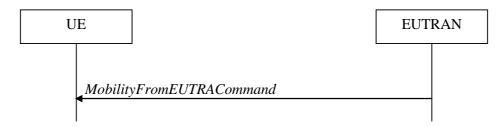


Figure 5.4.3.1-1: Mobility from E-UTRA, successful

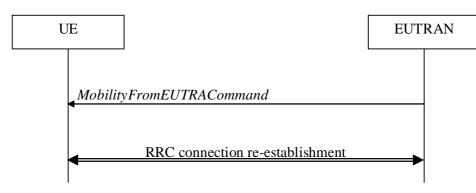


Figure 5.4.3.1-2: Mobility from E-UTRA, failure

The purpose of this procedure is to move a UE in RRC_CONNECTED to a cell using another Radio Access Technology (RAT), e.g. GERAN, UTRA, CDMA2000 systems, NR, or handover a UE to an E-UTRA cell connected to another type of CN. The mobility from E-UTRA procedure covers the following type of mobility:

- handover, i.e. the *MobilityFromEUTRACommand* message includes radio resources that have been allocated for the UE in the target cell;
- cell change order, i.e. the *MobilityFromEUTRACommand* message may include information facilitating access of and/ or connection establishment in the target cell, e.g. system information. Cell change order is applicable only to GERAN; and
- enhanced CS fallback to CDMA2000 1xRTT, i.e. the *MobilityFromEUTRACommand* message includes radio resources that have been allocated for the UE in the target cell. The enhanced CS fallback to CDMA2000 1xRTT may be combined with concurrent handover or redirection to CDMA2000 HRPD.
- NOTE: For the case of dual receiver/transmitter enhanced CS fallback to CDMA2000 1xRTT, the *DLInformationTransfer* message is used instead of the *MobilityFromEUTRACommand* message (see TS 36.300 [9]).

5.4.3.2 Initiation

E-UTRAN initiates the mobility from E-UTRA procedure to a UE in RRC_CONNECTED, possibly in response to a *MeasurementReport* message or in response to reception of CS fallback indication for the UE from MME, by sending a *MobilityFromEUTRACommand* message. E-UTRAN applies the procedure as follows:

- the procedure is initiated only when AS-security has been activated, and SRB2 with at least one DRB are setup and not suspended;

5.4.3.3 Reception of the *MobilityFromEUTRACommand* by the UE

The UE shall be able to receive a *MobilityFromEUTRACommand* message and perform a cell change order to GERAN, even if no prior UE measurements have been performed on the target cell.

- 1> stop timer T310, if running;
- 1> stop timer T312, if running;
- 1> if T309 is running:
 - 2> stop timer T309 for all access categories;
 - 2> perform the actions as specified in 5.3.16.4.
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to *handover*:
 - 2> if the *targetRAT-Type* is set to *utra* or *geran*:
 - 3> consider inter-RAT mobility as initiated towards the RAT indicated by the *targetRAT-Type* included in the *MobilityFromEUTRACommand* message;

- 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers;
- 3> access the target cell indicated in the inter-RAT message in accordance with the specifications of the target RAT;
- 3> if the *targetRAT-Type* is set to *geran*:
 - 4> use the contents of *systemInformation*, if provided for PS Handover, as the system information to begin access on the target GERAN cell;
- NOTE 1: If there are DRBs for which no radio bearers are established in the target RAT as indicated in the *targetRAT-MessageContainer* in the message, the E-UTRA RRC part of the UE does not indicate the release of the concerned DRBs to the upper layers. Upper layers may derive which bearers are not established from information received from the AS of the target RAT.
- NOTE 2: In case of SR-VCC, the DRB to be replaced is specified in TS 23.216 [61].
 - 2> else if the *targetRAT-Type* is set to *eutra*:
 - 3> consider inter-system mobility as initiated towards E-UTRA;
 - 3> forward the *nas-SecurityParamFromEUTRA* to the upper layers, if included;
 - 3> access the target cell indicated in the inter-RAT message in accordance with clause 5.4.2.3;
 - 2> else if the *targetRAT-Type* is set to *nr*:
 - 3> consider inter-RAT mobility as initiated towards NR;
 - 3> access the target cell indicated in the inter-RAT message in accordance with the specifications in TS 38.331 [82];
 - 2> else if the *targetRAT-Type* is set to *cdma2000-1XRTT* or *cdma2000-HRPD*:
 - 3> forward the targetRAT-Type and the targetRAT-MessageContainer to the CDMA2000 upper layers for the UE to access the cell(s) indicated in the inter-RAT message in accordance with the specifications of the CDMA2000 target-RAT;
- 1> else if the MobilityFromEUTRACommand message includes the purpose set to cellChangeOrder:
 - 2> start timer T304 with the timer value set to t304, as included in the MobilityFromEUTRACommand message;
 - 2> if the *targetRAT-Type* is set to *geran*:
 - 3> if *networkControlOrder* is included in the *MobilityFromEUTRACommand* message:
 - 4> apply the value as specified in TS 44.060 [36];
 - 3> else:
 - 4> acquire networkControlOrder and apply the value as specified in TS 44.060 [36];
 - 3> use the contents of *systemInformation*, if provided, as the system information to begin access on the target GERAN cell;
 - 2> establish the connection to the target cell indicated in the *CellChangeOrder*;
- NOTE 3: The criteria for success or failure of the cell change order to GERAN are specified in TS 44.060 [36].
- 1> if the *MobilityFromEUTRACommand* message includes the *purpose* set to *e-CSFB*:
 - 2> if messageContCDMA2000-1XRTT is present:
 - 3> forward the *messageContCDMA2000-1XRTT* to the CDMA2000 upper layers for the UE to access the cell(s) indicated in the inter-RAT message in accordance with the specification of the target RAT;
 - 2> if *mobilityCDMA2000-HRPD* is present and is set to *handover*:

- 3> forward the *messageContCDMA2000-HRPD* to the CDMA2000 upper layers for the UE to access the cell(s) indicated in the inter-RAT message in accordance with the specification of the target RAT;
- 2> if *mobilityCDMA2000-HRPD* is present and is set to *redirection*:
 - 3> forward the redirectCarrierCDMA2000-HRPD to the CDMA2000 upper layers;
- NOTE 4: When the CDMA2000 upper layers in the UE receive both the *messageContCDMA2000-1XRTT* and *messageContCDMA2000-HRPD* the UE performs concurrent access to both CDMA2000 1xRTT and CDMA2000 HRPD RAT.
- NOTE 5: The UE should perform the handover, the cell change order or enhanced 1xRTT CS fallback as soon as possible following the reception of the RRC message *MobilityFromEUTRACommand*, which could be before confirming successful reception (HARQ and ARQ) of this message.

5.4.3.4 Successful completion of the mobility from E-UTRA

Upon successfully completing the handover, the cell change order or enhanced 1xRTT CS fallback, the UE shall:

- 1> if the *targetRAT-Type* in the received *MobilityFromEUTRACommand* is set to *eutra* (intra-E-UTRA inter-system HO):
 - 2> indicate to the upper layers associated to the source system the release of the RRC connection together with the release cause 'other';

2> the procedure ends;

- 1> else if the UE was connected to 5GC prior to the reception of the *MobilityFromEUTRACommand* and the *targetRAT-Type* in the received *MobilityFromEUTRACommand* is set to *nr*:
 - 2> reset MAC;
 - 2> stop all timers that are running;
 - 2> release ran-NotificationAreaInfo, if stored;
 - 2> release the AS security context including the K_{RRCenc} key, the K_{RRCint}, the K_{UPint} key and the K_{UPenc} key, if stored;
 - 2> release all radio resources, including release of the RLC entity, the MAC configuration and the associated PDCP entity and SDAP entity for all established RBs;
- NOTE 1: PDCP and SDAP configured by the source configurations RAT prior to the handover that are reconfigured and re-used by target RAT when delta signalling (i.e., during inter-RAT intra-sytem handover when *fullConfig* is not present) is used, are not released as part of this procedure.

1> else:

- 2> perform the actions upon leaving RRC_CONNECTED as specified in 5.3.12, with release cause 'other';
- NOTE 2: If the UE performs enhanced 1xRTT CS fallback along with concurrent mobility to CDMA2000 HRPD and the connection to either CDMA2000 1xRTT or CDMA2000 HRPD succeeds, then the mobility from E-UTRA is considered successful.

5.4.3.5 Mobility from E-UTRA failure

- 1> if T304 configured in the MobilityFromEUTRACommand message expires (mobility from E-UTRA failure); or
- 1> if the UE does not succeed in establishing the connection to the target radio access technology; or
- 1> if the UE is unable to comply with (part of) the configuration included in the MobilityFromEUTRACommand message; or

1> if there is a protocol error in the inter RAT information included in the *MobilityFromEUTRACommand* message, causing the UE to fail the procedure according to the specifications applicable for the target RAT (i.e. according to sub-clause 5.3.5.6 if the *targetRAT-Type* in the received *MobilityFromEUTRACommand* is set to *eutra*):

```
2> stop T304, if running;
```

2> if the *cs-FallbackIndicator* in the *MobilityFromEUTRACommand* message was set to *TRUE* or *e-CSFB* was present:

3> indicate to upper layers that the CS fallback procedure has failed;

- 2> revert back to the configuration used in the source PCell, excluding the configuration configured by the *physicalConfigDedicated*, *mac-MainConfig* and *sps-Config*;
- 2> initiate the connection re-establishment procedure as specified in 5.3.7;
- NOTE: For enhanced CS fallback to CDMA2000 1xRTT, the above UE behavior applies only when the UE is attempting the enhanced 1xRTT CS fallback and connection to the target radio access technology fails or if the UE is attempting enhanced 1xRTT CS fallback along with concurrent mobility to CDMA2000 HRPD and connection to both the target radio access technologies fails.

5.4.4 Handover from E-UTRA preparation request (CDMA2000)

5.4.4.1 General

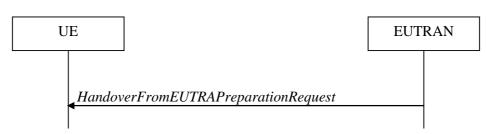


Figure 5.4.4.1-1: Handover from E-UTRA preparation request

The purpose of this procedure is to trigger the UE to prepare for handover or enhanced 1xRTT CS fallback to CDMA2000 by requesting a connection with this network. The UE may use this procedure to concurrently prepare for handover to CDMA2000 HRPD along with preparation for enhanced CS fallback to CDMA2000 1xRTT. This procedure applies to CDMA2000 capable UEs only.

This procedure is also used to trigger the UE which supports dual Rx/Tx enhanced 1xCSFB to redirect its second radio to CDMA2000 1xRTT.

The handover from E-UTRA preparation request procedure applies when signalling radio bearers are established.

5.4.4.2 Initiation

E-UTRAN initiates the handover from E-UTRA preparation request procedure to a UE in RRC_CONNECTED, possibly in response to a *MeasurementReport* message or CS fallback indication for the UE, by sending a *HandoverFromEUTRAPreparationRequest* message. E-UTRA initiates the procedure only when AS security has been activated.

5.4.4.3 Reception of the HandoverFromEUTRAPreparationRequest by the UE

Upon reception of the *HandoverFromEUTRAPreparationRequest* message, the UE shall:

1> if *dualRxTxRedirectIndicator* is present in the received message:

- 2> forward *dualRxTxRedirectIndicator* to the CDMA2000 upper layers;
- 2> forward redirectCarrierCDMA2000-1XRTT to the CDMA2000 upper layers, if included;

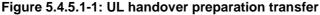
1> else:

- 2> indicate the request to prepare handover or enhanced 1xRTT CS fallback and forward the *cdma2000-Type* to the CDMA2000 upper layers;
- 2> if *cdma2000-Type* is set to *type1XRTT*:
 - 3> forward the *rand* and the *mobilityParameters* to the CDMA2000 upper layers;
- 2> if concurrPrepCDMA2000-HRPD is present in the received message:
 - 3> forward concurrPrepCDMA2000-HRPD to the CDMA2000 upper layers;
- 2> else:
 - 3> forward concurrPrepCDMA2000-HRPD, with its value set to FALSE, to the CDMA2000 upper layers;

5.4.5 UL handover preparation transfer (CDMA2000)

5.4.5.1 General





The purpose of this procedure is to tunnel the handover related CDMA2000 dedicated information or enhanced 1xRTT CS fallback related CDMA2000 dedicated information from UE to E-UTRAN when requested by the higher layers. The procedure is triggered by the higher layers on receipt of *HandoverFromEUTRAPreparationRequest* message. If preparing for enhanced CS fallback to CDMA2000 1xRTT and handover to CDMA2000 HRPD, the UE sends two consecutive *ULHandoverPreparationTransfer* messages to E-UTRAN, one per addressed CDMA2000 RAT Type. This procedure applies to CDMA2000 capable UEs only.

5.4.5.2 Initiation

A UE in RRC_CONNECTED initiates the UL handover preparation transfer procedure whenever there is a need to transfer handover or enhanced 1xRTT CS fallback related non-3GPP dedicated information. The UE initiates the UL handover preparation transfer procedure by sending the *ULHandoverPreparationTransfer* message.

5.4.5.3 Actions related to transmission of the ULHandoverPreparationTransfer message

The UE shall set the contents of the ULHandoverPreparationTransfer message as follows:

- 1> include the *cdma2000-Type* and the *dedicatedInfo*;
- 1> if the *cdma2000-Type* is set to *type1XRTT*:

2> include the *meid* and set it to the value received from the CDMA2000 upper layers;

1> submit the ULHandoverPreparationTransfer message to lower layers for transmission, upon which the procedure ends;

5.4.5.4 Failure to deliver the ULHandoverPreparationTransfer message

The UE shall:

- 1> if the UE is unable to guarantee successful delivery of ULHandoverPreparationTransfer messages:
 - 2> inform upper layers about the possible failure to deliver the information contained in the concerned ULHandoverPreparationTransfer message;

5.4.6 Inter-RAT cell change order to E-UTRAN

5.4.6.1 General

The purpose of the inter-RAT cell change order to E-UTRAN procedure is to transfer, under the control of the source radio access technology, a connection between the UE and another radio access technology (e.g. GSM/ GPRS) to E-UTRAN.

5.4.6.2 Initiation

The procedure is initiated when a radio access technology other than E-UTRAN, e.g. GSM/GPRS, using procedures specific for that RAT, orders the UE to change to an E-UTRAN cell. In response, upper layers request the establishment of an RRC connection as specified in clause 5.3.3.

NOTE: Within the message used to order the UE to change to an E-UTRAN cell, the source RAT should specify the identity of the target E-UTRAN cell as specified in the specifications for that RAT.

The UE shall:

1> upon receiving an *RRCConnectionSetup* message:

2> consider the inter-RAT cell change order procedure to have completed successfully;

5.4.6.3 UE fails to complete an inter-RAT cell change order

If the inter-RAT cell change order fails the UE shall return to the other radio access technology and proceed as specified in the appropriate specifications for that RAT.

The UE shall:

- 1> upon failure to establish the RRC connection as specified in clause 5.3.3:
 - 2> consider the inter-RAT cell change order procedure to have failed;
- NOTE: The cell change was network ordered. Therefore, failure to change to the target PCell should not cause the UE to move to UE-controlled cell selection.

5.5 Measurements

5.5.1 Introduction

The UE reports measurement information in accordance with the measurement configuration as provided by E-UTRAN. E-UTRAN provides the measurement configuration applicable for a UE in RRC_CONNECTED by means of dedicated signalling, i.e. using the *RRCConnectionReconfiguration* or *RRCConnectionResume* message.

The UE can be requested to perform the following types of measurements:

- Intra-frequency measurements: measurements at the downlink carrier frequency(ies) of the serving cell(s).
- Inter-frequency measurements: measurements at frequencies that differ from any of the downlink carrier frequency(ies) of the serving cell(s).
- Inter-RAT measurements of NR frequencies.
- Inter-RAT measurements of UTRA frequencies.
- Inter-RAT measurements of GERAN frequencies.

- Inter-RAT measurements of CDMA2000 HRPD or CDMA2000 1xRTT or WLAN frequencies.
- CBR measurements.
- Sensing measurements.

The measurement configuration includes the following parameters:

- 1. Measurement objects: The objects on which the UE shall perform the measurements.
 - For intra-frequency and inter-frequency measurements a measurement object is a single E-UTRA carrier frequency. Associated with this carrier frequency, E-UTRAN can configure a list of cell specific offsets, a list of 'blacklisted' cells and a list of 'whitelisted' cells. Blacklisted cells are not considered in event evaluation or measurement reporting.
 - For inter-RAT NR measurements a measurement object is a single NR carrier frequency. Associated with this carrier frequency, E-UTRAN can configure a list of 'blacklisted' cells. Blacklisted cells are not considered in event evaluation or measurement reporting.
 - For inter-RAT UTRA measurements a measurement object is a set of cells on a single UTRA carrier frequency.
 - For inter-RAT GERAN measurements a measurement object is a set of GERAN carrier frequencies.
 - For inter-RAT CDMA2000 measurements a measurement object is a set of cells on a single (HRPD or 1xRTT) carrier frequency.
 - For inter-RAT WLAN measurements a measurement object is a set of WLAN identifiers and optionally a set of WLAN frequencies.
 - For CBR measurements and sensing measurements a measurement object is a set of transmission resource pools for V2X sidelink communication.
- NOTE 1: Some measurements using the above mentioned measurement objects, only concern a single cell, e.g. measurements used to report neighbouring cell system information, PCell UE Rx-Tx time difference, or a pair of cells, e.g. SSTD measurements between the PCell and the PSCell.
- 2. **Reporting configurations**: A list of reporting configurations where each reporting configuration consists of the following:
 - Reporting criterion: The criterion that triggers the UE to send a measurement report. This can either be periodical or a single event description.
 - Reporting format: The quantities that the UE includes in the measurement report and associated information (e.g. number of cells to report).
- 3. **Measurement identities**: A list of measurement identities where each measurement identity links one measurement object with one reporting configuration. By configuring multiple measurement identities it is possible to link more than one measurement object to the same reporting configuration, as well as to link more than one reporting configuration to the same measurement object. The measurement identity is used as a reference number in the measurement report.
- 4. **Quantity configurations:** One quantity configuration is configured per RAT type. The quantity configuration defines the measurement quantities and associated filtering used for all event evaluation and related reporting of that measurement type. One filter can be configured per measurement quantity, except for NR where the network may configure up to 2 sets of quantity configurations each comprising per measurement quantity seperate filters for cell and RS index measurement results. The quantity configuration set that applies for a given measurement is indicated within the NR measurement object.
- 5. Measurement gaps: Periods that the UE may use to perform measurements, i.e. no (UL, DL) transmissions are scheduled.

E-UTRAN only configures a single measurement object for a given frequency (except for WLAN and except for CBR measurements), i.e. it is not possible to configure two or more measurement objects for the same frequency with different associated parameters, e.g. different offsets and/ or blacklists. E-UTRAN may configure multiple instances of the same event e.g. by configuring two reporting configurations with different thresholds.

The UE maintains a single measurement object list, a single reporting configuration list, and a single measurement identities list. The measurement object list includes measurement objects, that are specified per RAT type, possibly including intra-frequency object(s) (i.e. the object(s) corresponding to the serving frequency(ies)), inter-frequency object(s) and inter-RAT objects. Similarly, the reporting configuration list includes E-UTRA and inter-RAT reporting configurations. Any measurement object can be linked to any reporting configuration of the same RAT type. Some reporting configurations may not be linked to a measurement object. Likewise, some measurement objects may not be linked to a reporting configuration.

The measurement procedures distinguish the following types of cells:

- 1. The serving cell(s) these are the PCell and one or more SCells, if configured for a UE supporting CA or DC. Likewise, NR serving cell(s) are the NR PCell, NR PSCell and NR SCells, if the UE is configured with MR-DC.
- 2. Listed cells these are cells listed within the measurement object(s) or, for inter-RAT WLAN, the WLANs matching the WLAN identifiers configured in the measurement object or the WLAN the UE is connected to.
- 3. Detected cells these are cells that are not listed within the measurement object(s) but are detected by the UE on the carrier frequency(ies) indicated by the measurement object(s) or, for inter-RAT WLAN, the WLANs not included in the *measObjectWLAN* but meeting the triggering requirements.

For E-UTRA, the UE measures and reports on the serving cell(s), listed cells, detected cells, transmission resource pools for V2X sidelink communication, and, for RSSI and channel occupancy measurements, the UE measures and reports on any reception on the indicated frequency. For inter-RAT NR, the UE measures and reports on detected cells and, if configured with MR-DC, on NR serving cell(s). For inter-RAT UTRA, the UE measures and reports on listed cells and optionally on cells that are within a range for which reporting is allowed by E-UTRAN. For inter-RAT GERAN, the UE measures and reports on detected cells. For inter-RAT CDMA2000, the UE measures and reports on listed cells. For inter-RAT WLAN, the UE measures and reports on listed cells.

- NOTE 2: For inter-RAT UTRA and CDMA2000, the UE measures and reports also on detected cells for the purpose of SON.
- NOTE 3: This specification is based on the assumption that typically CSG cells of home deployment type are not indicated within the neighbour list. Furthermore, the assumption is that for non-home deployments, the physical cell identity is unique within the area of a large macro cell (i.e. as for UTRAN).

Whenever the procedural specification, other than contained in sub-clause 5.5.2, refers to a field it concerns a field included in the *VarMeasConfig* unless explicitly stated otherwise i.e. only the measurement configuration procedure covers the direct UE action related to the received *measConfig*.

5.5.2 Measurement configuration

5.5.2.1 General

E-UTRAN applies the procedure as follows:

- to ensure that, whenever the UE has a measConfig, it includes a measObject for each LTE serving frequency;
- to configure at most one measurement identity using a reporting configuration with the *purpose* set to *reportCGI*;
- for E-UTRA serving frequencies, set the EARFCN within the corresponding *measObject* according to the band as used for reception/ transmission;
- to configure at most one measurement identity using a reporting configuration with *ul-DelayConfig*;
- to configure at most one measurement identity using a reporting configuration with reportSFTD-Meas;
- to configure at most one *MeasObjectNR* with the same *carrierFreq*;

The UE shall:

1> if the received *measConfig* includes the *measObjectToRemoveList*:

2> perform the measurement object removal procedure as specified in 5.5.2.4;

1> if the received *measConfig* includes the *measObjectToAddModList*:

2> perform the measurement object addition/ modification procedure as specified in 5.5.2.5;

1> if the received *measConfig* includes the *reportConfigToRemoveList*:

2> perform the reporting configuration removal procedure as specified in 5.5.2.6;

- 1> if the received *measConfig* includes the *reportConfigToAddModList*:
 - 2> perform the reporting configuration addition/ modification procedure as specified in 5.5.2.7;
- 1> if the received *measConfig* includes the *quantityConfig*:
 - 2> perform the quantity configuration procedure as specified in 5.5.2.8;
- 1> if the received *measConfig* includes the *measIdToRemoveList*:
 - 2> perform the measurement identity removal procedure as specified in 5.5.2.2;
- 1> if the received *measConfig* includes the *measIdToAddModList*:

2> perform the measurement identity addition/ modification procedure as specified in 5.5.2.3;

- 1> if the received measConfig includes the measGapConfig or measGapConfigPerCC-List:
 - 2> perform the measurement gap configuration procedure as specified in 5.5.2.9;
- 1> if the received *measConfig* includes the *measGapConfigDensePRS*:
 - 2> perform the measurement gap configuration procedure for RSTD measurements with dense PRS configuration as specified in 5.5.2.9a;
- 1> if the received *measConfig* includes the *measGapSharingConfig*:
 - 2> perform the measurement gap sharing configuration procedure as specified in 5.5.2.12;
- 1> if the received *measConfig* includes the *s-Measure*:
 - 2> set the parameter *s*-Measure within VarMeasConfig to the lowest value of the RSRP ranges indicated by the received value of *s*-Measure;
- 1> if the received *measConfig* includes the *preRegistrationInfoHRPD*:
 - 2> forward the *preRegistrationInfoHRPD* to CDMA2000 upper layers;
- 1> if the received *measConfig* includes the *speedStatePars*:
 - 2> set the parameter *speedStatePars* within *VarMeasConfig* to the received value of *speedStatePars*;
- 1> if the received *measConfig* includes the *allowInterruptions*:

2> set the parameter allowInterruptions within VarMeasConfig to the received value of allowInterruptions;

5.5.2.2 Measurement identity removal

The UE shall:

- 1> for each measId included in the received measIdToRemoveList that is part of the current UE configuration in VarMeasConfig:
 - 2> remove the entry with the matching *measId* from the *measIdList* within the *VarMeasConfig*;
 - 2> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 2> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;

NOTE: The UE does not consider the message as erroneous if the *measIdToRemoveList* includes any *measId* value that is not part of the current UE configuration.

5.5.2.2a Measurement identity autonomous removal

The UE shall:

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the associated *reportConfig* concerns an event involving a serving cell while the concerned serving cell is not configured; or
 - 2> if the associated *reportConfig* concerns an event involving a WLAN mobility set while the concerned WLAN mobility set is not configured; or
 - 2> if the associated *reportConfig* concerns an event involving a transmission resource pool for V2X sidelink communication while the concerned resource pool is not configured; or
 - 2> if the associated *reportConfig* concerns an event involving *reportSFTD-Meas* set to *pSCell* while the *nr-Config* is not configured:
 - 3> remove the *measId* from the *measIdList* within the *VarMeasConfig*;
 - 3> remove the measurement reporting entry for this *measId* from the *VarMeasReportList*, if included;
 - 3> stop the periodical reporting timer if running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
- NOTE 1: The above UE autonomous removal of *measId*'s applies only for measurement events A1, A2, A6, and also applies for events A3 and A5 if configured for PSCell and W2 and W3 and V1 and V2 and event involving *reportSFTD-Meas* set to *pSCell*, if configured.
- NOTE 2: When performed during re-establishment, the UE is only configured with a primary frequency (i.e. the SCell(s) and WLAN mobility set are released, if configured).

5.5.2.3 Measurement identity addition/ modification

E-UTRAN applies the procedure as follows:

- configure a *measId* only if the corresponding measurement object, the corresponding reporting configuration and the corresponding quantity configuration, are configured;

The UE shall:

- 1> for each *measId* included in the received *measIdToAddModList*:
 - 2> if an entry with the matching *measId* exists in the *measIdList* within the *VarMeasConfig*:

3> replace the entry with the value received for this *measId*;

2> else:

3> add a new entry for this *measId* within the *VarMeasConfig*;

- 2> remove the measurement reporting entry for this *measId* from the *VarMeasReportList*, if included;
- 2> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
- 2> if the *triggerType* is set to *periodical* and the *purpose* is set to *reportCGI* in the *reportConfig* associated with this *measId*:
 - 3> if the *measObject* associated with this *measId* concerns E-UTRA:
 - 4> if the *si-RequestForHO* is included in the *reportConfig* associated with this *measId*:

5> if the UE is a category 0 UE according to TS 36.306 [5]:

6> start timer T321 with the timer value set to 190 ms for this measId;

5> else:

6> start timer T321 with the timer value set to 150 ms for this *measId*;

4> else:

- 5> start timer T321 with the timer value set to 1 second for this *measId*;
- 3> else if the *measObject* associated with this *measId* concerns UTRA:
 - 4> if the *si-RequestForHO* is included in the *reportConfig* associated with this *measId*:
 - 5> for UTRA FDD, start timer T321 with the timer value set to 2 seconds for this *measId*;
 - 5> for UTRA TDD, start timer T321 with the timer value set to [1 second] for this measId;
 - 4> else:
 - 5> start timer T321 with the timer value set to 8 seconds for this *measId*;
- 3> else if the *measObject* associated with this *measId* concerns NR:
 - 4> if the *measObject* associated with this *measId* concerns FR1:
 - 5> start timer T321 with the timer value set to 2 seconds for this *measId*;
 - 4> if the *measObject* associated with this *measId* concerns FR2:

5> start timer T321 with the timer value set to 16 seconds for this *measId*;

3> else:

4> start timer T321 with the timer value set to 8 seconds for this measId;

5.5.2.4 Measurement object removal

The UE shall:

- 1> for each measObjectId included in the received measObjectToRemoveList that is part of the current UE configuration in VarMeasConfig:
 - 2> remove the entry with the matching measObjectId from the measObjectList within the VarMeasConfig;
 - 2> remove all *measId* associated with this *measObjectId* from the *measIdList* within the *VarMeasConfig*, if any;
 - 2> if a *measId* is removed from the *measIdList*:
 - 3> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 3> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
- NOTE: The UE does not consider the message as erroneous if the *measObjectToRemoveList* includes any *measObjectId* value that is not part of the current UE configuration.

5.5.2.5 Measurement object addition/ modification

The UE shall:

- 1> for each measObjectId included in the received measObjectToAddModList:
 - 2> if an entry with the matching *measObjectId* exists in the *measObjectList* within the *VarMeasConfig*, for this entry:

- 3> reconfigure the entry with the value received for this measObject, except for the fields cellsToAddModList, blackCellsToAddModList, whiteCellsToAddModList, altTTT-CellsToAddModList, cellsToRemoveList, blackCellsToRemoveList, whiteCellsToRemoveList, altTTT-CellsToRemoveList, measSubframePatternConfigNeigh, measDS-Config, wlan-ToAddModList, wlan-ToRemoveList, tx-ResourcePoolToRemoveList and tx-ResourcePoolToAddList;
- 3> if the received *measObject* includes the *cellsToRemoveList*:
 - 4> for each *cellIndex* included in the *cellsToRemoveList*:

5> remove the entry with the matching *cellIndex* from the *cellsToAddModList*;

- 3> if the received *measObject* includes the *cellsToAddModList*:
 - 4> for each *cellIndex* value included in the *cellsToAddModList*:
 - 5> if an entry with the matching *cellIndex* exists in the *cellsToAddModList*:

6> replace the entry with the value received for this *cellIndex*;

5> else:

6> add a new entry for the received *cellIndex* to the *cellsToAddModList*;

- 3> if the received *measObject* includes the *blackCellsToRemoveList*:
 - 4> for each *cellIndex* included in the *blackCellsToRemoveList*:

5> remove the entry with the matching *cellIndex* from the *blackCellsToAddModList*;

- NOTE 1: For each *cellIndex* included in the *blackCellsToRemoveList* that concerns overlapping ranges of cells, a cell is removed from the black list of cells only if all cell indexes containing it are removed.
 - 3> if the received *measObject* includes the *blackCellsToAddModList*:
 - 4> for each *cellIndex* included in the *blackCellsToAddModList*:
 - 5> if an entry with the matching *cellIndex* is included in the *blackCellsToAddModList*:

6> replace the entry with the value received for this *cellIndex*;

5> else:

6> add a new entry for the received *cellIndex* to the *blackCellsToAddModList*;

- 3> if the received *measObject* includes the *whiteCellsToRemoveList*:
 - 4> for each *cellIndex* included in the *whiteCellsToRemoveList*:

5> remove the entry with the matching *cellIndex* from the *whiteCellsToAddModList*;

- NOTE 2: For each *cellIndex* included in the *whiteCellsToRemoveList* that concerns overlapping ranges of cells, a cell is removed from the white list of cells only if all cell indexes containing it are removed.
 - 3> if the received *measObject* includes the *whiteCellsToAddModList*:
 - 4> for each *cellIndex* included in the *whiteCellsToAddModList*:
 - 5> if an entry with the matching *cellIndex* is included in the *whiteCellsToAddModList*:

6> replace the entry with the value received for this *cellIndex*;

- 5> else:
 - 6> add a new entry for the received *cellIndex* to the *whiteCellsToAddModList*;
- 3> if the received *measObject* includes the *altTTT-CellsToRemoveList*:

4> for each *cellIndex* included in the *altTTT-CellsToRemoveList*:

5> remove the entry with the matching *cellIndex* from the *altTTT-CellsToAddModList*;

- NOTE 3: For each *cellIndex* included in the *altTTT-CellsToRemoveList* that concerns overlapping ranges of cells, a cell is removed from the list of cells only if all cell indexes containing it are removed.
 - 3> if the received *measObject* includes the *altTTT-CellsToAddModList*:
 - 4> for each *cellIndex* value included in the *altTTT-CellsToAddModList*:
 - 5> if an entry with the matching *cellIndex* exists in the *altTTT-CellsToAddModList*:

6> replace the entry with the value received for this *cellIndex*;

5> else:

6> add a new entry for the received *cellIndex* to the *altTTT-CellsToAddModList*;

- 3> if the received *measObject* includes *measSubframePatternConfigNeigh*:
 - 4> set measSubframePatternConfigNeigh within the VarMeasConfig to the value of the received field
- 3> if the received *measObject* includes *measDS-Config*:
 - 4> if *measDS-Config* is set to *setup*:
 - 5> if the received *measDS-Config* includes the *measCSI-RS-ToRemoveList*:
 - 6> for each measCSI-RS-Id included in the measCSI-RS-ToRemoveList:
 - 7> remove the entry with the matching measCSI-RS-Id from the measCSI-RS-ToAddModList;
 - 5> if the received *measDS-Config* includes the *measCSI-RS-ToAddModList*, for each *measCSI-RS-Id* value included in the *measCSI-RS-ToAddModList*:
 - 6> if an entry with the matching measCSI-RS-Id exists in the measCSI-RS-ToAddModList:
 - 7> replace the entry with the value received for this measCSI-RS-Id;
 - 6> else:
 - 7> add a new entry for the received *measCSI-RS-Id* to the *measCSI-RS-ToAddModList*;
 - 5> set other fields of the measDS-Config within the VarMeasConfig to the value of the received fields;
 - 5> perform the discovery signals measurement timing configuration procedure as specified in 5.5.2.10;

4> else:

5> release the discovery signals measurement configuration;

- 3> if the received *measObject* modifies fields other than *cellsForWhichToReportSFTD*:
 - 4> for each measId associated with this measObjectId in the measIdList within the VarMeasConfig, if any:
 - 5> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 5> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
- 3> if the received *measObject* includes the *wlan-ToRemoveList*:
 - 4> for each WLAN-Identifiers included in the wlan-ToRemoveList:

5> remove the entry with the matching WLAN-Identifiers from the wlan-ToAddModList;

NOTE 3a: Matching of WLAN-Identifiers requires that all WLAN identifier fields should be same.

- 3> if the received *measObject* includes the *wlan-ToAddModList*:
 - 4> for each WLAN-Identifiers included in the wlan-ToAddModList:
 - 5> add a new entry for the received WLAN-Identifiers to the wlan-ToAddModList;
- 3> if the received *measObject* includes the *tx-ResourcePoolToRemoveList*:
 - 4> for each transmission resource pool indicated in *tx-ResourcePoolToRemoveList*:
 - 5> remove the entry with the matching identity of the transmission resource pool from the *tx*-*ResourcePoolToAddList*;
- 3> if the received *measObject* includes the *tx-ResourcePoolToAddList*:
 - 4> for each transmission resource pool indicated in *tx-ResourcePoolToAddList*:
 - 5> add a new entry for the received identity of the transmission resource pool to the *tx-ResourcePoolToAddList*;

2> else:

3> add a new entry for the received *measObject* to the *measObjectList* within *VarMeasConfig*;

NOTE 4: UE does not need to retain cellForWhichToReportCGI in the measObject after reporting cgi-Info.

5.5.2.6 Reporting configuration removal

The UE shall:

- 1> for each *reportConfigId* included in the received *reportConfigToRemoveList* that is part of the current UE configuration in *VarMeasConfig*:
 - 2> remove the entry with the matching reportConfigId from the reportConfigList within the VarMeasConfig;
 - 2> remove all measId associated with the reportConfigId from the measIdList within the VarMeasConfig, if any;
 - 2> if a *measId* is removed from the *measIdList*:
 - 3> remove the measurement reporting entry for this *measId* from the *VarMeasReportList*, if included;
 - 3> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;
- NOTE: The UE does not consider the message as erroneous if the *reportConfigToRemoveList* includes any *reportConfigId* value that is not part of the current UE configuration.

5.5.2.7 Reporting configuration addition/ modification

The UE shall:

- 1> for each *reportConfigId* included in the received *reportConfigToAddModList*:
 - 2> if an entry with the matching *reportConfigId* exists in the *reportConfigList* within the *VarMeasConfig*, for this entry:
 - 3> reconfigure the entry with the value received for this *reportConfig*;
 - 3> for each *measId* associated with this *reportConfigId* included in the *measIdList* within the *VarMeasConfig*, if any:
 - 4> remove the measurement reporting entry for this *measId* from in *VarMeasReportList*, if included;

4> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;

2> else:

3> add a new entry for the received *reportConfig* to the *reportConfigList* within the *VarMeasConfig*;

5.5.2.8 Quantity configuration

The UE shall:

- 1> for each RAT for which the received *quantityConfig* includes parameter(s):
 - 2> set the corresponding parameter(s) in *quantityConfig* within *VarMeasConfig* to the value of the received *quantityConfig* parameter(s);
- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> remove the measurement reporting entry for this measId from the VarMeasReportList, if included;
 - 2> stop the periodical reporting timer or timer T321, whichever one is running, and reset the associated information (e.g. *timeToTrigger*) for this *measId*;

5.5.2.9 Measurement gap configuration

The UE shall:

- 1> if *measGapConfig* is set to *setup*:
 - 2> if a measurement gap configuration *measGapConfig* or *measGapConfigPerCC-List* is already setup, release the measurement gap configuration;
 - 2> if the gapOffset in *measGapConfig* indicates a non-uniform gap pattern:
 - 3> setup the measurement gap configuration indicated by the *measGapConfig* in accordance with the received *gapOffset*, i.e., the first subframe of the first gap of each non-uniform gap pattern occurs at an SFN and subframe meeting the following condition (SFN and subframe of MCG cells):

SFN mod *T* = FLOOR(*gapOffset*/10);

subframe = *gapOffset* mod 10;

with T = LMGRP/10 as defined in TS 36.133 [16];

2> else:

3> setup the measurement gap configuration indicated by the *measGapConfig* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition (SFN and subframe of MCG cells):

SFN mod *T* = FLOOR(*gapOffset*/10);

subframe = *gapOffset* mod 10;

with T = MGRP/10 as defined in TS 36.133 [16];

2> if (NG)EN-DC is configured:

3> if the UE is configured with *fr1-Gap* set to *TRUE*:

4> apply the gap configuration for LTE serving cells and for NR serving cells on FR1;

3> else:

4> apply the gap configuration for all LTE and NR serving cells;

- 2> if *mgta* is set to *TRUE*, apply a timing advance value of 0.5ms to the gap occurrences calculated above according to TS 38.133 [16];
- NOTE 1: The UE applies a single gap, which timing is relative to the MCG cells, even when configured with DC. In case of (NG)EN-DC, the UE may either be configured with a single (common) gap or with two separate gaps i.e. a first one for FR1 (configured by E-UTRA RRC) and a second one for FR2 (configured by NR RRC).
- 1> else if *measGapConfig* is set to *release*:

2> release the measurement gap configuration *measGapConfig*;

- 1> if measGapConfigPerCC-List is set to setup:
 - 2> if a measurement gap configuration measGapConfig is already setup, release measGapConfig;
 - 2> if measGapConfigToRemoveList is included:
 - 3> for each ServCellIndex included in the measGapConfigToRemoveList:
 - 4> release *measGapConfigCC* for the serving cell indicated by *servCellId*;
 - 2> if measGapConfigToAddModList is included:
 - 3> for each ServCellIndex included in the measGapConfigToAddModList:
 - 4> store *measGapConfigCC* for the serving cell indicated by *servCellId*;
 - 2> for each serving cell with stored *measGapConfigCC* indicating a non-uniform gap pattern, setup the measurement gap configuration indicated by the *measGapConfigCC* in accordance with the received *gapOffset*, i.e., the first subframe of the first gap of each non-uniform gap pattern occurs at an SFN and subframe meeting the following condition (SFN and subframe of MCG cells):

SFN mod *T* = FLOOR(*gapOffset*/10);

subframe = *gapOffset* mod 10;

with T = LMGRP/10 as defined in TS 36.133 [16];

2> for each serving cell with stored *measGapConfigCC* not indicating a non-uniform gap pattern, setup the measurement gap configuration indicated by the *measGapConfigCC* in accordance with the received *gapOffset*, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition (SFN and subframe of MCG cells):

SFN mod *T* = FLOOR(*gapOffset*/10);

subframe = *gapOffset* mod 10;

with T = MGRP/10 as defined in TS 36.133 [16];

NOTE 2: The UE applies gap timing relative to the MCG cells, even when configured with DC.

1> else (*measGapConfigPerCC-List* is set to *release*):

2> release the measurement gap configuration *measGapConfigPerCC-List*;

NOTE 3: When a SCell is released, the UE is not required to apply a per CC measurement gap configuration associated to the SCell.

5.5.2.9a Measurement gap configuration for RSTD measurements with dense PRS configuration

The UE shall:

^{1&}gt; if *measGapConfigDensePRS* is set to *setup*:

2> setup the measurement gap configuration indicated by the measGapConfigDensePRS in accordance with the received gapOffsetDensePRS, i.e., the first subframe of each gap occurs at an SFN and subframe meeting the following condition:

SFN mod *T* = FLOOR(*gapOffsetDensePRS*/10);

subframe = *gapOffsetDensePRS* mod 10;

with T = MGRP/10 as defined in TS 36.133 [16];

5.5.2.10 Discovery signals measurement timing configuration

The UE shall setup the discovery signals measurement timing configuration (DMTC) in accordance with the received *dmtc-PeriodOffset*, i.e., the first subframe of each DMTC occasion occurs at an SFN and subframe of the PCell meeting the following condition:

SFN mod *T* = FLOOR(*dmtc-Offset*/10);

subframe = *dmtc-Offset* mod 10;

with T = dmtc-*Periodicity*/10;

On the concerned frequency, the UE shall not consider discovery signals transmission in subframes outside the DMTC occasion for measurements including RRM measurements.

5.5.2.11 RSSI measurement timing configuration

The UE shall setup the RSSI measurement timing configuraton (RMTC) in accordance with the received *rmtc-Period*, *rmtc-SubframeOffset* if configured otherwise determined by the UE randomly, i.e. the first symbol of each RMTC occasion occurs at first symbol of an SFN and subframe of the PCell meeting the following condition:

SFN mod *T* = FLOOR(*rmtc-SubframeOffset*/10);

subframe = *rmtc-SubframeOffset* mod 10;

with T = rmtc-Period/10;

On the concerned frequency, the UE shall not consider RSSI measurements outside the configured RMTC occasion which lasts for *measDuration* for RSSI and channel occupancy measurements.

5.5.2.12 Measurement gap sharing configuration

The UE shall:

- 1> if *measGapSharingConfig* is set to *setup*:
 - 2> if a measurement gap sharing configuration is already setup, release the measurement gap sharing configuration;
 - 2> setup the measurement gap sharing configuration indicated by the *measGapSharingConfig* in accordance with the received *measGapSharingScheme* as defined in TS 36.133 [16];
- NOTE: In case of (NG)EN-DC, the UE may either be configured with a single (common) gap sharing or with two separate gap sharing configurations, i.e. a first one for FR1 (configured by E-UTRA RRC) and a second one for FR2 (configured by NR RRC). For the case of per FR gap configuration, the gap sharing configured here (i.e. E-UTRA RRC) is applicable only for FR1 gap.

1> else:

2> release the measurement gap sharing configuration;

5.5.2.13 NR measurement timing configuration

The UE shall setup the first SS/PBCH block measurement timing configuration (SMTC) in accordance with the received *periodicityAndOffset* (providing *Periodicity* and *Offset* value for the following condition) in the *MTC-SSB-NR* configuration i.e., the first subframe of each SMTC occasion occurs at an SFN and subframe of the PCell meeting the following condition:

SFN mod T = FLOOR(Offset/10);

if the *Periodicity* is larger than sf5:

subframe = *Offset* mod 10;

else;

subframe = Offset or (Offset +5);

with T = CEIL(Periodicity/10).

On the concerned frequency, the UE shall not consider SS/PBCH block transmission in subframes outside the SMTC occasion which lasts for *ssb-Duration* for measurements including RRM measurements except for SFTD measurement (see TS 36.133 [16], clause 8.1.2.4.25.2 and 8.1.2.4.26.1).

5.5.3 Performing measurements

5.5.3.1 General

For all measurements, except for UE Rx–Tx time difference measurements, RSSI, UL PDCP Packet Delay per QCI measurement, channel occupancy measurements, CBR measurement, sensing measurement and except for WLAN measurements of Band, Carrier Info, Available Admission Capacity, Backhaul Bandwidth, Channel Utilization, and Station Count, the UE applies the layer 3 filtering as specified in 5.5.3.2, before using the measured results for evaluation of reporting criteria or for measurement reporting. When performing measurements on NR carriers, the UE derives the cell quality as specified in 5.5.3.3 and the beam quality as specified in 5.5.3.4.

The UE shall:

1> whenever the UE has a *measConfig*, perform RSRP and RSRQ measurements for each serving cell as follows:

- 2> for the PCell, apply the time domain measurement resource restriction in accordance with measSubframePatternPCell, if configured;
- 2> if the UE supports CRS based discovery signals measurement:
 - 3> for each SCell in deactivated state, apply the discovery signals measurement timing configuration in accordance with *measDS-Config*, if configured within the *measObject* corresponding to the frequency of the SCell;
- 1> if the UE has a *measConfig* with *rs-sinr-Config* configured, perform RS-SINR (as indicated in the associated *reportConfig*) measurements as follows:
 - 2> perform the corresponding measurements on the frequency indicated in the associated *measObject* using available idle periods or using autonomous gaps as necessary;
- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the *purpose* for the associated *reportConfig* is set to *reportCGI*:
 - 3> if the RAT indicated in the associated *measObject* is not NR:
 - 4> if *si-RequestForHO* is configured for the associated *reportConfig*:
 - 5> perform the corresponding measurements on the frequency and RAT indicated in the associated measObject using autonomous gaps as necessary;
 - 4> else:

5> perform the corresponding measurements on the frequency and RAT indicated in the associated *measObject* using available idle periods or using autonomous gaps as necessary;

- 4> perform the corresponding measurements on the NR frequency indicated in the associated *measObject* using available idle periods;
- NOTE 1: If autonomous gaps are used to perform measurements, the UE is allowed to temporarily abort communication with all serving cell(s), i.e. create autonomous gaps to perform the corresponding measurements within the limits specified in TS 36.133 [16]. Otherwise, the UE only supports the measurements with the purpose set to *reportCGI* only if E-UTRAN has provided sufficient idle periods.
 - 3> try to acquire the global cell identity of the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* by acquiring the relevant system information from the concerned cell;
 - 3> if an entry in the *cellAccessRelatedInfoList* includes the selected PLMN, acquire the relevant system information from the concerned cell;
 - 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is an E-UTRAN cell:
 - 4> try to acquire the CSG identity, if the CSG identity is broadcast in the concerned cell;
 - 4> try to acquire the *trackingAreaCode* in the concerned cell;
 - 4> try to acquire the list of additional PLMN Identities, as included in the *plmn-IdentityList*, if multiple PLMN identities are broadcast in the concerned cell;
 - 4> if cellAccessRelatedInfoList is included, use trackingAreaCode and plmn-IdentityList from the entry of cellAccessRelatedInfoList containing the selected PLMN;
 - 4> if the *includeMultiBandInfo* is configured:
 - 5> try to acquire the *freqBandIndicator* in the *SystemInformationBlockType1* of the concerned cell;
 - 5> try to acquire the list of additional frequency band indicators, as included in the *multiBandInfoList*, if multiple frequency band indicators are included in the *SystemInformationBlockType1* of the concerned cell;
 - 5> try to acquire the *freqBandIndicatorPriority*, if the *freqBandIndicatorPriority* is included in the *SystemInformationBlockType1* of the concerned cell;
 - 4> if cellAccessRelatedInfoList-5GC is broadcast in the concerned cell and the UE is E-UTRA/5GC capable:

5> try to acquire the *cellAccessRelatedInfoList-5GC*;

- NOTE 2: The 'primary' PLMN is part of the global cell identity.
 - 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a UTRAN cell:
 - 4> try to acquire the LAC, the RAC and the list of additional PLMN Identities, if multiple PLMN identities are broadcast in the concerned cell;
 - 4> try to acquire the CSG identity, if the CSG identity is broadcast in the concerned cell;
 - 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a GERAN cell:
 - 4> try to acquire the RAC in the concerned cell;
 - 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a CDMA2000 cell and the *cdma2000-Type* included in the *measObject* is *typeHRPD*:

4> try to acquire the Sector ID in the concerned cell;

^{3&}gt; else:

- 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *measObject* is a CDMA2000 cell and the *cdma2000-Type* included in the *measObject* is *type1XRTT*:
 - 4> try to acquire the BASE ID, SID and NID in the concerned cell;
- 3> if the cell indicated by the *cellForWhichToReportCGI* included in the associated *MeasObject* is an NR cell:
 - 4> if the indicated cell is broadcasting SIB1 (see TS 38.213 [88], clause 13):
 - 5> try to acquire the plmn-IdentityInfoList including plmn-IdentityList, trackingAreaCode (if available), ran-AreaCode (if available) and cellIdentity for each entry of the plmn-IdentityInfoList;
 - 5> try to acquire the frequencyBandList, if multiple frequency bands are broadcasted in the concerned cell;
- 2> if the *ul-DelayConfig* is configured for the associated *reportConfig*:
 - 3> ignore the *measObject*;
 - 3> configure the PDCP layer to perform UL PDCP Packet Delay per QCI measurement;
- 2> else:
 - 3> if a measurement gap configuration is setup; or
 - 3> if the UE does not require measurement gaps to perform the concerned measurements:
 - 4> if *s-Measure* is not configured; or
 - 4> if the UE is not in NE-DC and the PCell RSRP, after layer 3 filtering, is lower than s-Measure; or
 - 4> if the UE is in NE-DC and the PSCell RSRP, after layer 3 filtering, is lower than s-Measure; or
 - 4> if the associated measObject concerns NR; or
 - 4> if measDS-Config is configured in the associated measObject:
 - 5> if the UE supports CSI-RS based discovery signals measurement; and
 - 5> if the *eventId* in the associated *reportConfig* is set to *eventC1* or *eventC2*, or if *reportStrongestCSI-RSs* is included in the associated *reportConfig*:
 - 6> perform the corresponding measurements of CSI-RS resources on the frequency indicated in the concerned *measObject*, applying the discovery signals measurement timing configuration in accordance with *measDS-Config* in the concerned *measObject*;
 - 6> if *reportCRS-Meas* is included in the associated *reportConfig*, perform the corresponding measurements of neighbouring cells on the frequencies indicated in the concerned *measObject* as follows:
 - 7> for neighbouring cells on the primary frequency, apply the time domain measurement resource restriction in accordance with *measSubframePatternConfigNeigh*, if configured in the concerned *measObject*;
 - 7> apply the discovery signals measurement timing configuration in accordance with *measDS*-*Config* in the concerned *measObject*;
 - 5> else:
 - 6> perform the corresponding measurements of neighbouring cells on the frequencies and RATs indicated in the concerned *measObject* as follows:
 - 7> for neighbouring cells on the primary frequency, apply the time domain measurement resource restriction in accordance with *measSubframePatternConfigNeigh*, if configured in the concerned *measObject*;

- 7> if the UE supports CRS based discovery signals measurement, apply the discovery signals measurement timing configuration in accordance with *measDS-Config*, if configured in the concerned *measObject*;
- 4> if the *ue-RxTxTimeDiffPeriodical* is configured in the associated *reportConfig*:

5> perform the UE Rx–Tx time difference measurements on the PCell;

4> if the *reportSSTD-Meas* is set to *true* or *pSCell* in the associated *reportConfig*:

5> perform SSTD measurements between the PCell and the PSCell;

- 4> if the *reportSFTD-Meas* is set to *pSCell* in the associated *reportConfig*:
 - 5> perform SFTD measurements between the PCell and the NR PSCell;
- 4> if the *reportSFTD-Meas* is set to *neighborCells* in the associated *reportConfig*:
 - 5> perform SFTD measurements between the PCell and NR cell(s) on the frequency indicated in the associated measObject;
- 4> if the *measRSSI-ReportConfig* is configured in the associated *reportConfig*:
 - 5> perform the RSSI and channel occupancy measurements on the frequency indicated in the associated *measObject*;

2> perform the evaluation of reporting criteria as specified in 5.5.4;

The UE capable of CBR measurement when configured to transmit non-P2X related V2X sidelink communication shall:

- 1> if in coverage on the frequency used for V2X sidelink communication transmission as defined in TS 36.304 [4], clause 11.4; or
- 1> if the concerned frequency is included in v2x-InterFreqInfoList in RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26:
 - 2> if the UE is in RRC_IDLE:
 - 3> if the concerned frequency is the camped frequency:
 - 4> perform CBR measurement on the pools in v2x-CommTxPoolNormalCommon and v2x-CommTxPoolExceptional if included in SystemInformationBlockType21;
 - 3> else if v2x-CommTxPoolNormal or v2x-CommTxPoolExceptional is included in v2x-InterFreqInfoList for the concerned frequency within SystemInformationBlockType21 or SystemInformationBlockType26:
 - 4> perform CBR measurement on pools in v2x-CommTxPoolNormal and v2x-CommTxPoolExceptional in v2x-InterFreqInfoList for the concerned frequency in SystemInformationBlockType21 or SystemInformationBlockType26;
 - 3> else if the concerned frequency broadcasts SystemInformationBlockType21:
 - 4> perform CBR measurement on pools in v2x-CommTxPoolNormalCommon and v2x-CommTxPoolExceptional if included in SystemInformationBlockType21 broadcast on the concerned frequency;
 - 2> if the UE is in RRC_CONNECTED:
 - 3> if *tx-ResourcePoolToAddList* is included in *VarMeasConfig*:

4> perform CBR measurements on each resource pool indicated in tx-ResourcePoolToAddList;

- 3> if the concerned frequency is the PCell's frequency:
 - 4> perform CBR measurement on the pools in v2x-CommTxPoolNormalDedicated or v2x-SchedulingPool if included in RRCConnectionReconfiguration, v2x-CommTxPoolExceptional if

included in *SystemInformationBlockType21* for the concerned frequency and *v2x-CommTxPoolExceptional* if included in *mobilityControlInfoV2X*;

- 3> else if v2x-CommTxPoolNormal, v2x-SchedulingPool or v2x-CommTxPoolExceptional is included in v2x-InterFreqInfoList for the concerned frequency within RRCConnectionReconfiguration:
 - 4> perform CBR measurement on pools in v2x-CommTxPoolNormal, v2x-SchedulingPool, and v2x-CommTxPoolExceptional if included in v2x-InterFreqInfoList for the concerned frequency in RRCConnectionReconfiguration;
- 3> else if the concerned frequency broadcasts SystemInformationBlockType21:
 - 4> perform CBR measurement on pools in v2x-CommTxPoolNormalCommon and v2x-CommTxPoolExceptional if included in SystemInformationBlockType21 for the concerned frequency;

1> else:

2> perform CBR measurement on pools in v2x-CommTxPoolList in SL-V2X-Preconfiguration for the concerned frequency;

The UE capable of sensing measurement, with commTxResources set to scheduled, shall:

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if measSensing-Config is configured in the associated measObject
 - 3> perform the sensing measurement in accordance with TS 36.213 [23] on the pools of v2x-SchedulingPool and also indicated in *tx-ResourcePoolToAddList* in the associated *measObject*, using *sensingSubchannelNumber*, *sensingPeriodicity*, *sensingReselectionCounter* and *sensingPriority*.
- NOTE 3: The *s-Measure* defines when the UE is required to perform measurements. The UE is however allowed to perform measurements also when the PCell RSRP (or PSCell RSRP, if the UE is in NE-DC) exceeds *s-Measure*, e.g., to measure cells broadcasting a CSG identity following use of the autonomous search function as defined in TS 36.304 [4].
- NOTE 4: The UE may not perform the WLAN measurements it is configured with e.g. due to connection to another WLAN based on user preferences as specified in TS 23.402 [75] or due to turning off WLAN.

5.5.3.2 Layer 3 filtering

The UE shall:

- 1> for each measurement quantity that the UE performs measurements according to 5.5.3.1:
- NOTE 1: This does not include quantities configured solely for UE Rx-Tx time difference, SSTD measurements and RSSI, channel occupancy measurements, WLAN measurements of Band, Carrier Info, Available Admission Capacity, Backhaul Bandwidth, Channel Utilization, and Station Count, CBR measurement, sensing measurement and UL PDCP Packet Delay per QCI measurement i.e. for those types of measurements the UE ignores the *triggerQuantity* and *reportQuantity*.
 - 2> filter the measured result, before using for evaluation of reporting criteria or for measurement reporting, by the following formula:

$$F_n = (1-a) \cdot F_{n-1} + a \cdot M_n$$

where

 M_n is the latest received measurement result from the physical layer;

 F_n is the updated filtered measurement result, that is used for evaluation of reporting criteria or for measurement reporting;

 F_{n-1} is the old filtered measurement result, where F_0 is set to M_1 when the first measurement result from the physical layer is received; and

 $a = 1/2^{(k/4)}$, where k is the *filterCoefficient* for the corresponding measurement quantity received by the *quantityConfig*;

- 2> adapt the filter such that the time characteristics of the filter are preserved at different input rates, observing that the *filterCoefficient* k assumes a sample rate equal to 200 ms;
- NOTE 2: If k is set to 0, no layer 3 filtering is applicable.
- NOTE 3: The filtering is performed in the same domain as used for evaluation of reporting criteria or for measurement reporting, i.e., logarithmic filtering for logarithmic measurements.
- NOTE 4: The filter input rate is implementation dependent, to fulfil the performance requirements set in TS 36.133 [16]. For further details about the physical layer measurements, see TS 36.133 [16].

5.5.3.3 Derivation of NR cell quality

The UE shall:

- 1> if the associated *measObject* includes *maxRS-IndexCellQual*; and
- 1> if there are multiple detected NR-SS beams associated to the cell; and
- 1> if *threshRS-Index* is configured and if for more than one of the NR-SS beams the measured result exceeds this threshold:
 - 2> consider the cell quality to be the linear average of the power values of the, up to maxRS-IndexCellQual, best of the detected NR-SS beams exceeding threshRS-Index;

1> else:

2> consider the cell quality to be the measurement result of the detected NR-SS beam, associated to the cell, with the highest measurement result;

5.5.3.4 Derivation of NR beam quality

The UE shall:

1> consider the beam quality to be the value resulting after layer 3 filtering, as specified in 5.5.3.2, of the measurement results of the concerned beam, where each result is averaged as described in TS 38.215 [89];

5.5.4 Measurement report triggering

5.5.4.1 General

If security has been activated successfully, the UE shall:

1> for each *measId* included in the *measIdList* within *VarMeasConfig*:

- 2> if the corresponding reportConfig includes a purpose set to reportStrongestCellsForSON:
 - 3> consider any neighbouring cell detected on the associated frequency to be applicable;
- 2> else if the corresponding *reportConfig* includes a purpose set to *reportCGI*:
 - 3> consider any neighbouring cell detected on the associated frequency/ set of frequencies (GERAN) which has a physical cell identity matching the value of the *cellForWhichToReportCGI* included in the corresponding *measObject* within the *VarMeasConfig* to be applicable;

2> else:

- 3> if the corresponding *measObject* concerns E-UTRA:
 - 4> if the *ue-RxTxTimeDiffPeriodical* is configured in the corresponding *reportConfig*:

5> consider only the PCell to be applicable;

4> else if the *reportSSTD-Meas* is set to *true* in the corresponding *reportConfig*:

5> consider the PSCell to be applicable;

4> else if the *eventA1* or *eventA2* is configured in the corresponding *reportConfig*:

5> consider only the serving cell to be applicable;

- 4> else if eventC1 or eventC2 is configured in the corresponding reportConfig; or if reportStrongestCSI-RSs is included in the corresponding reportConfig:
 - 5> consider a CSI-RS resource on the associated frequency to be applicable when the concerned CSI-RS resource is included in the *measCSI-RS-ToAddModList* defined within the *VarMeasConfig* for this *measId*;
- 4> else if *measRSSI-ReportConfig* is configured in the corresponding *reportConfig*:

5> consider the resource indicated by the *rmtc-Config* on the associated frequency to be applicable;

4> else:

- 5> if *useWhiteCellList* is set to *TRUE*:
 - 6> consider any neighbouring cell detected on the associated frequency to be applicable when the concerned cell is included in the *whiteCellsToAddModList* defined within the *VarMeasConfig* for this *measId*;
- 5> else:
 - 6> consider any neighbouring cell detected on the associated frequency to be applicable when the concerned cell is not included in the *blackCellsToAddModList* defined within the *VarMeasConfig* for this *measId*;
- 5> for events involving a serving cell on one frequency and neighbours on another frequency, consider the serving cell on the other frequency as a neighbouring cell;
- 4> if the corresponding reportConfig includes alternativeTimeToTrigger and if the UE supports alternativeTimeToTrigger:
 - 5> use the value of alternativeTimeToTrigger as the time to trigger instead of the value of timeToTrigger in the corresponding reportConfig for cells included in the altTTT-CellsToAddModList of the corresponding measObject;

3> else if the corresponding *measObject* concerns UTRA or CDMA2000:

- 4> consider a neighbouring cell on the associated frequency to be applicable when the concerned cell is included in the *cellsToAddModList* defined within the *VarMeasConfig* for this *measId* (i.e. the cell is included in the white-list);
- NOTE 0: The UE may also consider a neighbouring cell on the associated UTRA frequency to be applicable when the concerned cell is included in the *csg-allowedReportingCells* within the *VarMeasConfig* for this *measId*, if configured in the corresponding *measObjectUTRA* (i.e. the cell is included in the range of physical cell identities for which reporting is allowed).
 - 3> else if the corresponding *measObject* concerns GERAN:
 - 4> consider a neighbouring cell on the associated set of frequencies to be applicable when the concerned cell matches the *ncc-Permitted* defined within the *VarMeasConfig* for this *measId*;
 - 3> else if the corresponding *measObject* concerns WLAN:
 - 4> consider a WLAN on the associated set of frequencies, as indicated by *carrierFreq* or on all WLAN frequencies when *carrierFreq* is not present, to be applicable if the WLAN matches all WLAN identifiers of at least one entry within *wlan-Id-List* for this *measId*;

- 3> else if the corresponding *measObject* concerns NR:
 - 4> if the reportSFTD-Meas is set to pSCell in the corresponding reportConfigInterRAT:

5> consider the PSCell to be applicable;

- 4> else if the reportSFTD-Meas is set to neighborCells in the corresponding reportConfigInterRAT:
 - 5> if cellsForWhichToReportSFTD is configured in the corresponding measObjectNR:
 - 6> consider any neighbouring NR cell on the associated frequency that is included in *cellsForWhichToReportSFTD* to be applicable;
 - 5> else:
 - 6> consider up to 3 strongest neighbouring NR cells detected on the associated frequency to be applicable when the concerned cells are not included in the *blackCellsToAddModList* defined within the *VarMeasConfig* for this measId;
- 4> else:
 - 5> if the *eventB1* or *eventB2* is configured in the corresponding *reportConfig*:
 - 6> consider a serving cell, if any, on the associated NR frequency as neighbouring cell;
 - 5> consider any neighbouring cell detected on the associated frequency to be applicable when the concerned cell is not included in the *blackCellsToAddModList* defined within the *VarMeasConfig* for this *measId*;
- 2> if *tx-ResourcePoolToAddList* is configured in the *measObject*, and if the corresponding *reportConfig* includes a purpose set to *sidelink* or includes *eventV1* or *eventV2*:
 - 3> consider the transmission resource pools indicated by the *tx-ResourcePoolToAddList* defined within the *VarMeasConfig* for this *measId* to be applicable;
- 2> if the corresponding *reportConfig* includes a purpose set to *reportLocation*:

3> consider only the PCell to be applicable;

- 2> if the triggerType is set to event, and if the corresponding reportConfig does not include numberOfTriggeringCells, and if the entry condition applicable for this event, i.e. the event corresponding with the eventId of the corresponding reportConfig within VarMeasConfig, is fulfilled for one or more applicable cells for all measurements after layer 3 filtering taken during timeToTrigger defined for this event within the VarMeasConfig, while the VarMeasReportList does not include a measurement reporting entry for this measId (a first cell triggers the event):
 - 3> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 3> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> if the UE supports T312 and if *useT312* is included for this event and if T310 is running:
 - 4> if T312 is not running:
 - 5> start timer T312 with the value configured in the corresponding *measObject*;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the triggerType is set to event, and if the corresponding reportConfig does not include numberOfTriggeringCells, and if the entry condition applicable for this event, i.e. the event corresponding with the eventId of the corresponding reportConfig within VarMeasConfig, is fulfilled for one or more applicable cells not included in the cellsTriggeredList for all measurements after layer 3 filtering taken during timeToTrigger defined for this event within the VarMeasConfig (a subsequent cell triggers the event):

- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
- 3> if the UE supports T312 and if *useT312* is included for this event and if T310 is running:
 - 4> if T312 is not running:
 - 5> start timer T312 with the value configured in the corresponding *measObject*;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the triggerType is set to event and if the corresponding reportConfig includes numberOfTriggeringCells, and if the entry condition applicable for this event, i.e. the event corresponding with the eventId of the corresponding reportConfig within VarMeasConfig, is fulfilled for one or more applicable cells for all measurements after layer 3 filtering taken during timeToTrigger defined for this event within the VarMeasConfig:
 - 3> If the *VarMeasReportList* does not include a measurement reporting entry for this *measId* (a first cell triggers the event):
 - 4> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 3> If the number of cell(s) in the *cellsTriggeredList* is larger than or equal to *numberOfTriggeringCell*:
 - 4> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> else:
 - 4> include the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 4> If the number of cell(s) in the *cellsTriggeredList* is larger than or equal to *numberOfTriggeringCells*:
 - 5> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 5> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the *triggerType* is set to *event* and if the leaving condition applicable for this event is fulfilled for one or more of the cells included in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId* for all measurements after layer 3 filtering taken during *timeToTrigger* defined within the *VarMeasConfig* for this event:
 - 3> remove the concerned cell(s) in the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> if *reportOnLeave* is set to *TRUE* for the corresponding reporting configuration or if *a6-ReportOnLeave* is set to *TRUE* or if *a4-a5-ReportOnLeave* is set to TRUE for the corresponding reporting configuration:
 - 4> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 3> if the *cellsTriggeredList* defined within the *VarMeasReportList* for this *measId* is empty:
 - 4> remove the measurement reporting entry within the VarMeasReportList for this measId;
 - 4> stop the periodical reporting timer for this *measId*, if running;
- 2> if the *triggerType* is set to *event* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable CSI-RS resources for all measurements after layer 3 filtering taken during *timeToTrigger* defined for this event within the *VarMeasConfig*, while the *VarMeasReportList* does not include an measurement reporting entry for this *measId* (i.e. a first CSI-RS resource triggers the event):

3> include a measurement reporting entry within the VarMeasReportList for this measId;

- 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
- 3> include the concerned CSI-RS resource(s) in the csi-RS-TriggeredList defined within the VarMeasReportList for this measId;
- 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the triggerType is set to event and if the entry condition applicable for this event, i.e. the event corresponding with the eventId of the corresponding reportConfig within VarMeasConfig, is fulfilled for one or more applicable CSI-RS resources not included in the csi-RS-TriggeredList for all measurements after layer 3 filtering taken during timeToTrigger defined for this event within the VarMeasConfig (i.e. a subsequent CSI-RS resource triggers the event):
 - 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 3> include the concerned CSI-RS resource(s) in the csi-RS-TriggeredList defined within the VarMeasReportList for this measId;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the triggerType is set to event and if the leaving condition applicable for this event is fulfilled for one or more of the CSI-RS resources included in the csi-RS-TriggeredList defined within the VarMeasReportList for this measId for all measurements after layer 3 filtering taken during timeToTrigger defined within the VarMeasConfig for this event:
 - 3> remove the concerned CSI-RS resource(s) in the csi-RS-TriggeredList defined within the VarMeasReportList for this measId;
 - 3> if *c1-ReportOnLeave* is set to *TRUE* for the corresponding reporting configuration or if *c2-ReportOnLeave* is set to *TRUE* for the corresponding reporting configuration:
 - 4> initiate the measurement reporting procedure, as specified in 5.5.5;
 - 3> if the *csi-RS-TriggeredList* defined within the *VarMeasReportList* for this *measId* is empty:
 - 4> remove the measurement reporting entry within the VarMeasReportList for this measId;
 - 4> stop the periodical reporting timer for this *measId*, if running;
- 2> if the *triggerType* is set to *event* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable transmission resource pools for all measurements taken during *timeToTrigger* defined for this event within the *VarMeasConfig*, while the *VarMeasReportList* does not include an measurement reporting entry for this *measId* (a first transmission resource pool triggers the event):
 - 3> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 3> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;
 - 3> include the concerned transmission resource pool(s) in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if the *triggerType* is set to *event* and if the entry condition applicable for this event, i.e. the event corresponding with the *eventId* of the corresponding *reportConfig* within *VarMeasConfig*, is fulfilled for one or more applicable transmission resource pools not included in the *poolsTriggeredList* for all measurements taken during *timeToTrigger* defined for this event within the *VarMeasConfig* (a subsequent transmission resource pool triggers the event):
 - 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 3> include the concerned transmission resource pool(s) in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;

- 2> if the *triggerType* is set to *event* and if the leaving condition applicable for this event is fulfilled for one or more applicable transmission resource pools included in the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId* for all measurements taken during *timeToTrigger* defined within the *VarMeasConfig* for this event:
 - 3> remove the concerned transmission resource pool(s) from the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId*;
 - 3> if the *poolsTriggeredList* defined within the *VarMeasReportList* for this *measId* is empty:
 - 4> remove the measurement reporting entry within the VarMeasReportList for this measId;
 - 4> stop the periodical reporting timer for this *measId*, if running;
- 2> if the triggerType is set to event and if the eventId is set to eventH1 or eventH2 and if the entering condition applicable for this event, i.e. the event corresponding with the eventId of the corresponding reportConfig within VarMeasConfig, is fulfilled during timeToTrigger defined within the VarMeasConfig for this event:
 - 3> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> if *measRSSI-ReportConfig* is included and if a (first) measurement result is available:
 - 3> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 3> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;
 - 3> initiate the measurement reporting procedure as specified in 5.5.5 immediately when RSSI sample values are reported by the physical layer after the first L1 measurement duration;
- 2> else if the *purpose* is included and set to *reportStrongestCells, reportStrongestCellsForSON, reportLocation sidelink* or *sensing* and if a (first) measurement result is available:
 - 3> include a measurement reporting entry within the *VarMeasReportList* for this *measId*;
 - 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 3> if the *purpose* is set to *reportStrongestCells* and *reportStrongestCSI-RSs* is not included:
 - 4> if the *triggerType* is set to *periodical* and the corresponding *reportConfig* includes the *ul-DelayConfig*:
 - 5> initiate the measurement reporting procedure, as specified in 5.5.5, immediately after a first measurement result is provided by lower layers;
 - 4> else if the corresponding measurement object concerns WLAN:
 - 5> initiate the measurement reporting procedure, as specified in 5.5.5, immediately after the quantity to be reported becomes available for the PCell and for the applicable WLAN(s);
 - 4> else if the *reportAmount* exceeds 1:
 - 5> initiate the measurement reporting procedure, as specified in 5.5.5, immediately after the quantity to be reported becomes available for the PCell;
 - 4> else (i.e. the *reportAmount* is equal to 1):
 - 5> initiate the measurement reporting procedure, as specified in 5.5.5, immediately after the quantity to be reported becomes available for the PCell and for the strongest cell among the applicable cells, or becomes available for the pair of PCell and the PSCell in case of SSTD measurements, or becomes available for each requested pair of PCell and NR cell or the maximal measurement reporting delay as specified in TS 36.133 [16], clause 8.17.2.3 in case of SFTD measurements;
 - 3> if the *purpose* is set to *reportLocation*, *sidelink* or *sensing*:

- 4> if the *purpose* is set to *reportLocation*:
 - 5> initiate the measurement reporting procedure, as specified in 5.5.5, immediately after both the quantity to be reported for the PCell and the location information become available;
- 4> else if the *purpose* is set to *sidelink*:
 - 5> initiate the measurement reporting procedure as specified in 5.5.5 immediately after both the quantity to be reported for the PCell and the CBR measurement result become available;
- 4> else if the *purpose* is set to *sensing*:
 - 5> initiate the measurement reporting procedure as specified in 5.5.5 immediately after both the quantity to be reported for the PCell and the sensing measurement result become available;
- 3> else if the *purpose* is not set to *reportStrongestCells* or *reportStrongestCSI-RSs* is included:
 - 4> initiate the measurement reporting procedure, as specified in 5.5.5, when it has determined the strongest cells on the associated frequency;
- 2> upon expiry of the periodical reporting timer for this measId:

3> initiate the measurement reporting procedure, as specified in 5.5.5;

- 2> if the *purpose* is included and set to *reportCGI*:
 - 3> if the UE acquired the information needed to set all fields of cgi-Info for the requested cell; or
 - 3> if the UE detects that the requested NR cell is not transmitting SIB1:
 - 4> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 4> set the *numberOfReportsSent* defined within the *VarMeasReportList* for this *measId* to 0;
 - 4> stop timer T321;
 - 4> initiate the measurement reporting procedure, as specified in 5.5.5;
- 2> upon expiry of the T321 for this *measId*:
 - 3> include a measurement reporting entry within the VarMeasReportList for this measId;
 - 3> set the numberOfReportsSent defined within the VarMeasReportList for this measId to 0;
 - 3> initiate the measurement reporting procedure, as specified in 5.5.5;
- NOTE 2: The UE does not stop the periodical reporting with *triggerType* set to *event* or to *periodical* while the corresponding measurement is not performed due to the PCell RSRP (or PSCell RSRP, if the UE is in NE-DC) being equal to or better than *s-Measure* or due to the measurement gap not being setup.
- NOTE 3: If the UE is configured with DRX, the UE may delay the measurement reporting for event triggered and periodical triggered measurements until the Active Time, which is defined in TS 36.321 [6].

5.5.4.2 Event A1 (Serving becomes better than threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A1-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A1-2, as specified below, is fulfilled;
- 1> for this measurement, consider the primary or secondary cell that is configured on the frequency indicated in the associated *measObjectEUTRA* to be the serving cell;

Inequality A1-1 (Entering condition)

Ms-Hys > Thresh

Inequality A1-2 (Leaving condition)

Ms + Hys < Thresh

The variables in the formula are defined as follows:

Ms is the measurement result of the serving cell, not taking into account any offsets.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. *a1-Threshold* as defined within *reportConfigEUTRA* for this event).

Ms is expressed in dBm in case of RSRP, or in dB in case of RSRQ and RS-SINR.

Hys is expressed in dB.

Thresh is expressed in the same unit as *Ms*.

5.5.4.3 Event A2 (Serving becomes worse than threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A2-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A2-2, as specified below, is fulfilled;
- 1> for this measurement, consider the primary or secondary cell that is configured on the frequency indicated in the associated *measObjectEUTRA* to be the serving cell;

Inequality A2-1 (Entering condition)

Ms + Hys < Thresh

Inequality A2-2 (Leaving condition)

Ms-Hys > Thresh

The variables in the formula are defined as follows:

Ms is the measurement result of the serving cell, not taking into account any offsets.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. *a2-Threshold* as defined within *reportConfigEUTRA* for this event).

Ms is expressed in dBm in case of RSRP, or in dB in case of RSRQ and RS-SINR.

Hys is expressed in dB.

Thresh is expressed in the same unit as *Ms*.

5.5.4.4 Event A3 (Neighbour becomes offset better than PCell/ PSCell)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A3-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A3-2, as specified below, is fulfilled;
- 1> if *usePSCell* of the corresponding *reportConfig* is set to *true*:

2> use the PSCell for *Mp*, *Ofp and Ocp*;

1> else:

2> use the PCell for *Mp*, *Ofp and Ocp*;

- NOTE The cell(s) that triggers the event is on the frequency indicated in the associated *measObject* which may be different from the frequency used by the PCell/PSCell.
- Inequality A3-1 (Entering condition)

Mn + Ofn + Ocn - Hys > Mp + Ofp + Ocp + Off

- Inequality A3-2 (Leaving condition)
- Mn + Ofn + Ocn + Hys < Mp + Ofp + Ocp + Off

The variables in the formula are defined as follows:

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

- *Ofn* is the frequency specific offset of the frequency of the neighbour cell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell).
- **Ocn** is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.
- *Mp* is the measurement result of the PCell/PSCell, not taking into account any offsets.
- *Ofp* is the frequency specific offset of the frequency of the PCell/PSCell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the PCell/PSCell).
- *Ocp* is the cell specific offset of the PCell/ PSCell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the PCell/ PSCell), and is set to zero if not configured for the PCell/ PSCell.
- Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).
- Off is the offset parameter for this event (i.e. a3-Offset as defined within reportConfigEUTRA for this event).

Mn, Mp are expressed in dBm in case of RSRP, or in dB in case of RSRQ and RS-SINR.

Ofn, Ocn, Ofp, Ocp, Hys, Off are expressed in dB.

5.5.4.5 Event A4 (Neighbour becomes better than threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A4-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A4-2, as specified below, is fulfilled;

Inequality A4-1 (Entering condition)

Mn + Ofn + Ocn - Hys > Thresh

Inequality A4-2 (Leaving condition)

Mn + Ofn + Ocn + Hys < Thresh

The variables in the formula are defined as follows:

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

- *Ofn* is the frequency specific offset of the frequency of the neighbour cell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell).
- **Ocn** is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.

Hys is the hysteresis parameter for this event (i.e. *hysteresis* as defined within *reportConfigEUTRA* for this event).

Thresh is the threshold parameter for this event (i.e. *a4-Threshold* as defined within *reportConfigEUTRA* for this event).

Mn is expressed in dBm in case of RSRP, or in dB in case of RSRQ and RS-SINR.

Ofn, Ocn, Hys are expressed in dB.

Thresh is expressed in the same unit as *Mn*.

5.5.4.6 Event A5 (PCell/ PSCell becomes worse than threshold1 and neighbour becomes better than threshold2)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when both condition A5-1 and condition A5-2, as specified below, are fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A5-3 or condition A5-4, i.e. at least one of the two, as specified below, is fulfilled;
- 1> if *usePSCell* of the corresponding *reportConfig* is set to *true*:

2> use the PSCell for *Mp*;

1> else:

2> use the PCell for Mp;

NOTE: The cell(s) that triggers the event is on the frequency indicated in the associated *measObject* which may be different from the frequency used by the PCell/PSCell.

Inequality A5-1 (Entering condition 1)

Mp + Hys < Threshl

Inequality A5-2 (Entering condition 2)

Mn + Ofn + Ocn - Hys > Thresh2

Inequality A5-3 (Leaving condition 1)

Mp-Hys > Thresh

Inequality A5-4 (Leaving condition 2)

Mn + Ofn + Ocn + Hys < Thresh2

The variables in the formula are defined as follows:

Mp is the measurement result of the PCell/PSCell, not taking into account any offsets.

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

Ofn is the frequency specific offset of the frequency of the neighbour cell (i.e. *offsetFreq* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell).

Ocn is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

- *Thresh1* is the threshold parameter for this event (i.e. *a5-Threshold1* as defined within *reportConfigEUTRA* for this event).
- *Thresh2* is the threshold parameter for this event (i.e. *a5-Threshold2* as defined within *reportConfigEUTRA* for this event).

Mn, Mp are expressed in dBm in case of RSRP, or in dB in case of RSRQ and RS-SINR.

Ofn, Ocn, Hys are expressed in dB.

Thresh1 is expressed in the same unit as *Mp*.

Thresh2 is expressed in the same unit as *Mn*.

5.5.4.6a Event A6 (Neighbour becomes offset better than SCell)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition A6-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition A6-2, as specified below, is fulfilled;
- 1> for this measurement, consider the (secondary) cell that is configured on the frequency indicated in the associated *measObjectEUTRA* to be the serving cell;
- NOTE: The neighbour(s) is on the same frequency as the SCell i.e. both are on the frequency indicated in the associated *measObject*.

Inequality A6-1 (Entering condition)

Mn + Ocn - Hys > Ms + Ocs + Off

Inequality A6-2 (Leaving condition)

Mn + Ocn + Hys < Ms + Ocs + Off

The variables in the formula are defined as follows:

Mn is the measurement result of the neighbouring cell, not taking into account any offsets.

- *Ocn* is the cell specific offset of the neighbour cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the neighbour cell), and set to zero if not configured for the neighbour cell.
- Ms is the measurement result of the serving cell, not taking into account any offsets.
- *Ocs* is the cell specific offset of the serving cell (i.e. *cellIndividualOffset* as defined within *measObjectEUTRA* corresponding to the serving frequency), and is set to zero if not configured for the serving cell.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Off is the offset parameter for this event (i.e. a6-Offset as defined within reportConfigEUTRA for this event).

Mn, Ms are expressed in dBm in case of RSRP, or in dB in case of RSRQ and RS-SINR.

Ocn, Ocs, Hys, Off are expressed in dB.

5.5.4.7 Event B1 (Inter RAT neighbour becomes better than threshold)

The UE shall:

1> for UTRA and CDMA2000, only trigger the event for cells included in the corresponding measurement object;

1> consider the entering condition for this event to be satisfied when condition B1-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition B1-2, as specified below, is fulfilled;

Inequality B1-1 (Entering condition)

Mn + Ofn - Hys > Thresh

Inequality B1-2 (Leaving condition)

Mn + Ofn + Hys < Thresh

The variables in the formula are defined as follows:

- *Mn* is the measurement result of the inter-RAT neighbour cell, not taking into account any offsets. For CDMA 2000 measurement result, *pilotStrength* is divided by -2.
- *Ofn* is the frequency specific offset of the frequency of the inter-RAT neighbour cell (i.e. *offsetFreq* as defined within the *measObject* corresponding to the frequency of the neighbour inter-RAT cell).

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigInterRAT for this event).

- *Thresh* is the threshold parameter for this event (i.e. *b1-Threshold* as defined within *reportConfigInterRAT* for this event). For CDMA2000, *b1-Threshold* is divided by -2.
- *Mn* is expressed in dBm or in dB, depending on the measurement quantity of the inter-RAT neighbour cell.

Ofn, Hys are expressed in dB.

Thresh is expressed in the same unit as *Mn*.

5.5.4.8 Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2)

The UE shall:

- 1> for UTRA and CDMA2000, only trigger the event for cells included in the corresponding measurement object;
- 1> consider the entering condition for this event to be satisfied when both condition B2-1 and condition B2-2, as specified below, are fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition B2-3 or condition B2-4, i.e. at least one of the two, as specified below, is fulfilled;

Inequality B2-1 (Entering condition 1)

Mp + Hys < Threshl

Inequality B2-2 (Entering condition 2)

Mn + Ofn - Hys > Thresh2

Inequality B2-3 (Leaving condition 1)

Mp-Hys > Thresh

Inequality B2-4 (Leaving condition 2)

Mn + Ofn + Hys < Thresh2

The variables in the formula are defined as follows:

Mp is the measurement result of the PCell, not taking into account any offsets.

- *Mn* is the measurement result of the inter-RAT neighbour cell, not taking into account any offsets. For CDMA2000 measurement result, *pilotStrength* is divided by -2.
- *Ofn* is the frequency specific offset of the frequency of the inter-RAT neighbour cell (i.e. *offsetFreq* as defined within the *measObject* corresponding to the frequency of the inter-RAT neighbour cell).

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigInterRAT for this event).

- *Thresh1* is the threshold parameter for this event (i.e. b2-*Threshold1* as defined within *reportConfigInterRAT* for this event).
- *Thresh2* is the threshold parameter for this event (i.e. *b2-Threshold2* as defined within *reportConfigInterRAT* for this event). For CDMA2000, *b2-Threshold2* is divided by -2.

Mp is expressed in dBm in case of RSRP, or in dB in case of RSRQ.

Mn is expressed in dBm or dB, depending on the measurement quantity of the inter-RAT neighbour cell.

Ofn, Hys are expressed in dB.

Thresh1 is expressed in the same unit as *Mp*.

Thresh2 is expressed in the same unit as *Mn*.

5.5.4.9 Event C1 (CSI-RS resource becomes better than threshold)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition C1-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition C1-2, as specified below, is fulfilled;

Inequality C1-1 (Entering condition)

Mcr + Ocr - Hys > Thresh

Inequality C1-2 (Leaving condition)

Mcr + Ocr + Hys < Thresh

The variables in the formula are defined as follows:

Mcr is the measurement result of the CSI-RS resource, not taking into account any offsets.

Ocr is the CSI-RS specific offset (i.e. *csi-RS-IndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the CSI-RS resource), and set to zero if not configured for the CSI-RS resource.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. *c1-Threshold* as defined within *reportConfigEUTRA* for this event).

Mcr, Thresh are expressed in dBm.

Ocr, Hys are expressed in dB.

5.5.4.10 Event C2 (CSI-RS resource becomes offset better than reference CSI-RS resource)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition C2-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition C2-2, as specified below, is fulfilled;

NOTE: The CSI-RS resource(s) that triggers the event is on the same frequency as the reference CSI-RS resource, i.e. both are on the frequency indicated in the associated *measObject*.

Inequality C2-1 (Entering condition)

Mcr + Ocr - Hys > Mref + Oref + Off

Inequality C2-2 (Leaving condition)

Mcr + Ocr + Hys < Mref + Oref + Off

The variables in the formula are defined as follows:

Mcr is the measurement result of the CSI-RS resource, not taking into account any offsets.

- *Ocr* is the CSI-RS specific offset of the CSI-RS resource (i.e. *csi-RS-IndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the CSI-RS resource), and set to zero if not configured for the CSI-RS resource.
- *Mref* is the measurement result of the reference CSI-RS resource (i.e. *c2-RefCSI-RS* as defined within *reportConfigEUTRA* for this event), not taking into account any offsets.
- *Oref* is the CSI-RS specific offset of the reference CSI-RS resource (i.e. *csi-RS-IndividualOffset* as defined within *measObjectEUTRA* corresponding to the frequency of the reference CSI-RS resource), and is set to zero if not configured for the reference CSI-RS resource.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Off is the offset parameter for this event (i.e. c2-Offset as defined within reportConfigEUTRA for this event).

Mcr, Mref are expressed in dBm.

Ocr, Oref, Hys, Off are expressed in dB.

5.5.4.11 Event W1 (WLAN becomes better than a threshold)

The UE shall:

1> consider the entering condition for this event to be satisfied when *wlan-MobilitySet* within *VarWLAN-MobilityConfig* does not contain any entries and condition W1-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition W1-2, as specified below, is fulfilled;

Inequality W1-1 (Entering condition)

Mn - Hys > Thresh

Inequality W1-2 (Leaving condition)

Mn + Hys < Thresh

The variables in the formula are defined as follows:

Mn is the measurement result of WLAN(s) configured in the measurement object, not taking into account any offsets.

Hys is the hysteresis parameter for this event.

Thresh is the threshold parameter for this event (i.e. *w1-Threshold* as defined within *reportConfigInterRAT* for this event).

Mn is expressed in dBm.

Hys is expressed in dB.

Thresh is expressed in the same unit as Mn.

5.5.4.12 Event W2 (All WLAN inside WLAN mobility set becomes worse than threshold1 and a WLAN outside WLAN mobility set becomes better than threshold2)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when both conditions W2-1 and W2-2 as specified below are fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition W2-3 or condition W2-4, i.e. at least one of the two, as specified below is fulfilled;

Inequality W2-1 (Entering condition 1)

Ms + Hys < Thresh

Inequality W2-2 (Entering condition 2)

Mn - Hys > Thresh2

Inequality W2-3 (Leaving condition 1)

Ms - Hys > Thresh

Inequality W2-4 (Leaving condition 2)

Mn + Hys < Thresh2

The variables in the formula are defined as follows:

- *Ms* is the measurement result of WLAN(s) which matches all WLAN identifiers of at least one entry within *wlan-MobilitySet* in *VarWLAN-MobilityConfig*, not taking into account any offsets.
- *Mn* is the measurement result of WLAN(s) configured in the measurement object which does not match all WLAN identifiers of any entry within *wlan-MobilitySet* in *VarWLAN-MobilityConfig*, not taking into account any offsets.

Hys is the hysteresis parameter for this event.

- *Thresh1* is the threshold parameter for this event (i.e. *w2-Threshold1* as defined within *reportConfigInterRAT* for this event).
- *Thresh2* is the threshold parameter for this event (i.e. *w2-Threshold2* as defined within *reportConfigInterRAT* for this event).

Mn, *Ms* are expressed in dBm.

Hys is expressed in dB.

Thresh1 is expressed in the same unit as Ms.

Thresh2 is expressed in the same unit as *Mn*.

5.5.4.13 Event W3 (All WLAN inside WLAN mobility set becomes worse than a threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition W3-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition W3-2, as specified below, is fulfilled;

Inequality W3-1 (Entering condition)

Ms + Hys < Thresh

Inequality W3-2 (Leaving condition)

Ms - Hys > Thresh

The variables in the formula are defined as follows:

Ms is the measurement result of WLAN(s) which matches all WLAN identifiers of at least one entry within *wlan-MobilitySet* in *VarWLAN-MobilityConfig*, not taking into account any offsets.

Hys is the hysteresis parameter for this event.

Thresh is the threshold parameter for this event (i.e. *w3-Threshold* as defined within *reportConfigInterRAT* for this event).

Ms is expressed in dBm.

Hys is expressed in dB.

Thresh is expressed in the same unit as *Ms*.

5.5.4.14 Event V1 (The channel busy ratio is above a threshold)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition V1-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition V1-2, as specified below, is fulfilled;

Inequality V1-1 (Entering condition)

Ms - Hys > Thresh

Inequality V1-2 (Leaving condition)

Ms + Hys < Thresh

The variables in the formula are defined as follows:

Ms is the measurement result of channel busy ratio of the transmission resource pool, not taking into account any offsets.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. v1-Threshold as defined within ReportConfigEUTRA).

Ms is expressed in decimal from 0 to 1 in steps of 0.01.

Hys is expressed is in the same unit as Ms.

Thresh is expressed in the same unit as *Ms*.

5.5.4.15 Event V2 (The channel busy ratio is below a threshold)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition V2-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition V2-2, as specified below, is fulfilled;

Inequality V2-1 (Entering condition)

Ms + Hys < Thresh

Inequality V2-2 (Leaving condition)

```
Ms - Hys > Thresh
```

The variables in the formula are defined as follows:

Ms is the measurement result of channel busy ratio of the transmission resource pool, not taking into account any offsets.

Hys is the hysteresis parameter for this event (i.e. hysteresis as defined within reportConfigEUTRA for this event).

Thresh is the threshold parameter for this event (i.e. v2-Threshold as defined within ReportConfigEUTRA).

Ms is expressed in decimal from 0 to 1 in steps of 0.01.

Hys is expressed is in the same unit as *Ms*.

Thresh is expressed in the same unit as *Ms*.

5.5.4.16 Event H1 (The Aerial UE height is above a threshold)

The UE shall:

- 1> consider the entering condition for this event to be satisfied when condition H1-1, as specified below, is fulfilled;
- 1> consider the leaving condition for this event to be satisfied when condition H1-2, as specified below, is fulfilled;

Inequality H1-1 (Entering condition)

Ms - Hys > Thresh + Offset

Inequality H1-2 (Leaving condition)

Ms + Hys < Thresh + Offset

The variables in the formula are defined as follows:

Ms is the Aerial UE height, not taking into account any offsets.

Hys is the hysteresis parameter (i.e. *h1-Hysteresis* as defined within *ReportConfigEUTRA*) for this event.

- *Thresh* is the reference threshold parameter for this event given in *MeasConfig*(i.e. *heightThreshRef* as defined within *MeasConfig*).
- *Offset* is the offset value to *heightThreshRef* to obtain the absolute threshold for this event. (i.e. *h1-ThresholdOffset* as defined within *ReportConfigEUTRA*)

Ms is expressed in meters.

Thresh is expressed in the same unit as *Ms*.

5.5.4.17 Event H2 (The Aerial UE height is below a threshold)

The UE shall:

1> consider the entering condition for this event to be satisfied when condition H2-1, as specified below, is fulfilled;

1> consider the leaving condition for this event to be satisfied when condition H2-2, as specified below, is fulfilled;

Inequality H2-1 (Entering condition)

Ms + Hys < Thresh + Offset

Inequality H2-2 (Leaving condition)

Ms - Hys > Thresh + Offset

The variables in the formula are defined as follows:

Ms is the Aerial UE height, not taking into account any offsets.

Hys is the hysteresis parameter (i.e. h2-Hysteresis as defined within ReportConfigEUTRA) for this event.

- *Thresh* is the reference threshold parameter for this event given in MeasConfig(i.e. *heightThreshRef* as defined within *MeasConfig*).
- *Offset* is the offset value to *heightThreshRef* to obtain the absolute threshold for this event. (i.e. *h2-ThresholdOffset* as defined within *ReportConfigEUTRA*)

Ms is expressed in meters.

Thresh is expressed in the same unit as Ms.

5.5.5 Measurement reporting

5.5.5.1 General



Figure 5.5.5.1-1: Measurement reporting

The purpose of this procedure is to transfer measurement results from the UE to E-UTRAN. The UE shall initiate this procedure only after successful security activation.

For the *measId* for which the measurement reporting procedure was triggered, the UE shall set the *measResults* within the *MeasurementReport* message as follows:

- 1> set the *measId* to the measurement identity that triggered the measurement reporting;
- 1> set the *measResultPCell* to include the quantities of the PCell;
- 1> set the *measResultServFreqList* to include for each E-UTRA SCell that is configured, if any, within *measResultSCell* the quantities of the concerned SCell, if available according to performance requirements in TS 36.133 [16], except if *purpose* for the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *reportLocation*;
- 1> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas*:
 - 2> for each E-UTRA serving frequency for which *measObjectId* is referenced in the *measIdList*, other than the frequency corresponding with the *measId* that triggered the measurement reporting:
 - 3> set the *measResultServFreqList* to include within *measResultBestNeighCell* the *physCellId* and the quantities of the best non-serving cell, based on RSRP, on the concerned serving frequency;
- 1> if the *triggerType* is set to *event*; and if the corresponding measObject concerns NR; and if *eventId* is set to *eventB1-NR* or *eventB2-NR*; or
- 1> if the triggerType is set to event; and if eventId is set to eventA3 or eventA4 or eventA5:
 - 2> if *purpose* for the *reportConfig* or *reportConfigInterRAT* associated with the *measId* that triggered the measurement reporting is set to a value other than *reportLocation*:
 - 3> set the *measResultServFreqListNR* to include for each NR serving frequency that the UE is configured to measure according to TS 38.331 [82], if any, the following:
 - 4> set measResultSCell to include the available results of the NR serving cell, as specified in 5.5.5.2;
 - 4> if the *reportConfig* associated with the *measId* that triggered the measurement reporting includes *reportAddNeighMeas* and if *eventId* is set to *eventA3* or *eventA4* or *eventA5*:
 - 5> set *measResultBestNeighCell* to include the available results, as specified in 5.5.5.2, of the nonserving cell with the highest sorting quantity determined as specified in 5.5.5.3;
 - 3> for each (serving or neighbouring) cell for which the UE reports results according to the previous, additionally include available beam results according to the following:
 - 4> if maxReportRS-Index is configured, set measResultRS-IndexList to include available results, as specified in 5.5.5.2, of up to maxReportRS-Index beams, ordered based on the quantity determined as specified in 5.5.5.3;

- 1> if there is at least one applicable neighbouring cell to report:
 - 2> set the measResultNeighCells to include the best neighbouring cells up to maxReportCells in accordance with the following:
 - 3> if the *triggerType* is set to *event*:
 - 4> include the cells included in the *cellsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;
 - 3> else:
 - 4> include the applicable cells for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;
- NOTE 1: The reliability of the report (i.e. the certainty it contains the strongest cells on the concerned frequency) depends on the measurement configuration i.e. the *reportInterval*. The related performance requirements are specified in TS 36.133 [16].
 - 3> for each cell that is included in the measResultNeighCells, include the physCellId;
 - 3> if the *triggerType* is set to *event*; or the *purpose* is set to *reportStrongestCells* or to *reportStrongestCellsForSON*:
 - 4> for each included cell, include the layer 3 filtered measured results in accordance with the reportConfig for this measId, ordered as follows:
 - 5> if the *measObject* associated with this *measId* concerns E-UTRA:
 - 6> set the *measResult* to include the quantity(ies) indicated in the *reportQuantity* within the concerned *reportConfig*;
 - 6> sort the included cells in order of decreasing *triggerQuantity*, i.e. the best cell is included first;
 - 5> if the *measObject* associated with this *measId* concerns NR:
 - 6> set the *measResultCell* to include the quantity(ies) indicated in the *reportQuantityCellNR* within the concerned *reportConfig*;
 - 6> if maxReportRS-Index and reportQuantityRS-IndexNR are configured, set measResultRS-IndexList to include the result of the best beam if threshRS-Index is included in the VarMeasConfig for the corresponding measObject, and the remaining beams whose quantity is above threshRS-Index, up to maxReportRS-Index beams in total:
 - 7> order beams based on the sorting quantity determined as specified in 5.5.5.3;
 - 7> for each included beam:
 - 8> include ssbIndex;
 - 8> if *reportRS-IndexResultsNR* is set to TRUE, for each quantity indicated, include the corresponding measurement result in *measResultSSB-Index* for each *ssb-Index*;
 - 6> sort the included cells in order of decreasing sorting quantity determined as specified in 5.5.5.3;
 - 5> if the *measObject* associated with this *measId* concerns UTRA FDD and if *ReportConfigInterRAT* includes the *reportQuantityUTRA-FDD*:
 - 6> set the *measResult* to include the quantities indicated by the *reportQuantityUTRA-FDD* in order of decreasing *measQuantityUTRA-FDD* within the *quantityConfig*, i.e. the best cell is included first;
 - 5> if the measObject associated with this measId concerns UTRA FDD and if ReportConfigInterRAT does not include the reportQuantityUTRA-FDD; or
 - 5> if the measObject associated with this measId concerns UTRA TDD, GERAN or CDMA2000:

- 6> set the *measResult* to the quantity as configured for the concerned RAT within the *quantityConfig* in order of either decreasing quantity for UTRA and GERAN or increasing quantity for CDMA2000 *pilotStrength*, i.e. the best cell is included first;
- 3> else if the *purpose* is set to *reportCGI* and the corresponding *measObject* concerns a RAT other than NR:
 - 4> if the mandatory present fields of the *cgi-Info* for the cell indicated by the *cellForWhichToReportCGI* in the associated *measObject* have been obtained:
 - 5> if the *includeMultiBandInfo* is configured:
 - 6> include the *freqBandIndicator*;
 - 6> if the cell broadcasts the *multiBandInfoList*, include the *multiBandInfoList*;
 - 6> if the cell broadcasts the *freqBandIndicatorPriority*, include the *freqBandIndicatorPriority*;
 - 5> if the cell broadcasts a CSG identity:

6> include the *csg-Identity*;

- 6> include the *csg-MemberStatus* and set it to *member* if the cell is a CSG member cell;
- 5> if the *si-RequestForHO* is configured within the *reportConfig* associated with this *measId*:
 - 6> include the *cgi-Info* containing all the fields other than the *plmn-IdentityList* that have been successfully acquired;
 - 6> include, within the cgi-Info, the field plmn-IdentityList in accordance with the following:
 - 7> if the cell is a CSG member cell, determine the subset of the PLMN identities, starting from the second entry of PLMN identities in the broadcast information, that meet the following conditions:
 - a) equal to the RPLMN or an EPLMN; and
 - b) the CSG whitelist of the UE includes an entry comprising of the concerned PLMN identity and the CSG identity broadcast by the cell;
 - 7> if the subset of PLMN identities determined according to the previous includes at least one PLMN identity, include the *plmn-IdentityList* and set it to include this subset of the PLMN identities;
 - 7> if the cell is a CSG member cell, include the *primaryPLMN-Suitable* if the primary PLMN meets conditions a) and b) specified above;
 - 7> if the cell does not broadcast *csg-Identity* and the UE is capable of reporting the *plmn-IdentityList* from cells not broadcasting *csg-Identity*:
 - 8> include in the plmn-IdentityList the list of identities starting from the second entry of PLMN identities in the broadcast information;
- 5> else:
 - 6> include the *cgi-Info* containing all the fields that have been successfully acquired and in accordance with the following:
 - 7> include in the *plmn-IdentityList* the list of identities starting from the second entry of PLMN Identities in the broadcast information;
- 4> if the *cellAccessRelatedInfoList-5GC* has been acquired:

5> include *cgi-Info-5GC*;

NOTE 1a: The UE may include the cgi-Info-5GC even when the N1 mode is disabled.

3> else if the *purpose* is set to *reportCGI* and the corresponding *measObject* concerns NR RAT:

- 4> if the Cell information of cgi-Info for the cell indicated by the cellForWhichToReportCGI in the associated measObject has been obtained:
 - 5> include *plmn-IdentityInfoList* including *plmn-IdentityList*, *trackingAreaCode* (if available), *ran-AreaCode* (if available) and *cellIdentity* for each entry of the *plmn-IdentityInfoList*;
 - 5> include *frequencyBandList* if broadcasted;
- 4> else if MIB associated with the concerned *measObject* indicates that SIB1 is not broadcast:

5> include the *noSIB1* field;

- 1> for the cells included according to the previous (i.e. covering the PCell, the SCells, the best non-serving cells on serving frequencies as well as neighbouring EUTRA cells) include results according to the extended RSRQ if corresponding results are available according to the associated performance requirements defined in TS 36.133 [16];
- 1> if there is at least one applicable CSI-RS resource to report:
 - 2> set the *measResultCSI-RS-List* to include the best CSI-RS resources up to *maxReportCells* in accordance with the following:
 - 3> if the *triggerType* is set to *event*:
 - 4> include the CSI-RS resources included in the *csi-RS-TriggeredList* as defined within the *VarMeasReportList* for this *measId*;
 - 3> else:
 - 4> include the applicable CSI-RS resources for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;
- NOTE 2: The reliability of the report (i.e. the certainty it contains the strongest CSI-RS resources on the concerned frequency) depends on the measurement configuration i.e. the *reportInterval*. The related performance requirements are specified in TS 36.133 [16].
 - 3> for each CSI-RS resource that is included in the *measResultCSI-RS-List*:
 - 4> include the *measCSI-RS-Id*;
 - 4> include the layer 3 filtered measured results in accordance with the *reportConfig* for this *measId*, ordered as follow:
 - 5> set the *csi-RSRP-Result* to include the quantity indicated in the *reportQuantity* within the concerned *reportConfig* in order of decreasing *triggerQuantityCSI-RS*, i.e. the best CSI-RS resource is included first;
 - 4> if *reportCRS-Meas* is included within the associated *reportConfig*, and the cell indicated by *physCellId* of this CSI-RS resource is not a serving cell:
 - 5> set the *measResultNeighCells* to include the cell indicated by *physCellId* of this CSI-RS resource, and include the *physCellId*;
 - 5> set the *rsrpResult* to include the RSRP of the concerned cell, if available according to performance requirements in TS 36.133 [16];
 - 5> set the *rsrqResult* to include the RSRQ of the concerned cell, if available according to performance requirements in TS 36.133 [16];
- 1> if the *ue-RxTxTimeDiffPeriodical* is configured within the corresponding *reportConfig* for this *measId*;

2> set the *ue-RxTxTimeDiffResult* to the measurement result provided by lower layers;

2> set the *currentSFN*;

1> if the *measRSSI-ReportConfig* is configured within the corresponding *reportConfig* for this *measId*:

- 2> set the *rssi-Result* to the average of sample value(s) provided by lower layers in the *reportInterval*;
- 2> set the *channelOccupancy* to the rounded percentage of sample values which are beyond to the *channelOccupancyThreshold* within all the sample values in the *reportInterval*;
- 1> if uplink PDCP delay results are available:
 - 2> set the *ul-PDCP-DelayResultList* to include the uplink PDCP delay results available;
- 1> if the *includeLocationInfo* is configured in the corresponding *reportConfig* for this *measId* or if *purpose* for the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *reportLocation*; and detailed location information that has not been reported is available, set the content of the *locationInfo* as follows:
 - 2> include the locationCoordinates;
 - 2> if available, include the *gnss-TOD-msec*, except if *purpose* for the *reportConfig* associated with the *measId* that triggered the measurement reporting is set to *reportLocation*;
 - 2> include the *verticalVelocityInfo*, if available;
- 1> if the *includeWLAN-Meas* is configured in the corresponding *reportConfig* for this *measId*, set the *measResults* as follows:
 - 2> if available, include the *logMeasResultListWLAN*, in order of decreasing RSSI for WLAN APs;
- 1> if the *includeBT-Meas* is configured in the corresponding *reportConfig* for this *measId*, set the *measResults* as follows:

2> if available, include the *logMeasResultListBT*, in order of decreasing RSSI for Bluetooth beacons;

1> if the *reportSSTD-Meas* is set to *true* or *pSCell* within the corresponding *reportConfig* for this *measId*:

2> set the *measResultSSTD* to the measurement results provided by lower layers;

- 1> if the *reportSFTD-Meas* is set to *neighborCells* or *pSCell* within the corresponding *reportConfigInterRAT* for this *measId*, for each applicable cell for which results are available:
 - 2> set sfn-OffsetResult and frameBoundaryOffsetResult to the measurement results provided by lower layers;
 - 2> if the *ss-rsrp* in the *reportQuantityCellNR* is set to *TRUE* within the corresponding *reportConfigInterRAT* for this *measId*:
 - 3> include *rsrpResult* set to the RSRP of the concerned cell;
- 1> if there is at least one applicable transmission resource pool to report:
 - 2> set the measResultListCBR to include the CBR measurement results in accordance with the following:
 - 3> if the *triggerType* is set to *event*:
 - 4> include the transmission resource pools included in the *poolsTriggeredList* as defined within the *VarMeasReportList* for this *measId*;
 - 3> else:
 - 4> include the applicable transmission resource pools for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;
 - 3> for each transmission resource pool to be reported:
 - 4> set the *poolIdentity* to the *poolReportId* of this transmission resource pool;
 - 4> if *adjacencyPSCCH-PSSCH* is set to *TRUE* for this transmission resource pool:
 - 5> set the *cbr-PSSCH* to the CBR measurement result on PSSCH and PSCCH of this transmission resource pool provided by lower layers;

- 4> else:
 - 5> set the *cbr-PSSCH* to the CBR measurement result on PSSCH of this transmission resource pool provided by lower layers if available;
 - 5> set the *cbr-PSCCH* to the CBR measurement result on PSCCH of this transmission resource pool provided by lower layers if available;
- 2> set the *measResultSensing* to include the sensing measurement results in accordance with the following:
 - 3> include the applicable transmission resource pools for which the new measurement results became available since the last periodical reporting or since the measurement was initiated or reset;
 - 3> for each transmission resource pool to be reported:
 - 4> set the *sensingResult* to the sensing measurement results provided by the lower layers;
- 1> if the *triggerType* is set to *event*; and if *eventId* is set to *eventH1* or *eventH2*:

2> set the *heightUE* to include the altitude of the UE;

- 1> increment the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* by 1;
- 1> stop the periodical reporting timer, if running;
- 1> if the *numberOfReportsSent* as defined within the *VarMeasReportList* for this *measId* is less than the *reportAmount* as defined within the corresponding *reportConfig* for this *measId*:
 - 2> start the periodical reporting timer with the value of *reportInterval* as defined within the corresponding *reportConfig* for this *measId*;

1> else:

- 2> if the *triggerType* is set to *periodical*:
 - 3> remove the entry within the VarMeasReportList for this measId;
 - 3> remove this *measId* from the *measIdList* within *VarMeasConfig*;
- 1> if the measured results are for CDMA2000 HRPD:
 - 2> set the preRegistrationStatusHRPD to the UE's CDMA2000 upper layer's HRPD preRegistrationStatus;
- 1> if the measured results are for CDMA2000 1xRTT:
 - 2> set the preRegistrationStatusHRPD to FALSE;
- 1> if the measured results are for WLAN:
 - 2> set the *measResultListWLAN* to include the quantities within the *quantityConfigWLAN* for up to *maxReportCells* WLAN(s), determined according to the following:
 - 3> include WLAN the UE is connected to, if any;
 - 3> if *reportAnyWLAN* is set to TRUE:
 - 4> consider WLAN with any WLAN identifiers to be applicable for measurement reporting;

3> else:

- 4> consider only WLANs which do not match all WLAN identifiers of any entry within *wlan-MobilitySet* in *VarWLAN-MobilityConfig* to be applicable for measurement reporting;
- 3> include applicable WLAN in order of decreasing WLAN RSSI, i.e. the best WLAN is included first;
- 2> for each included WLAN:
 - 3> set wlan-Identifiers to include all WLAN identifiers that can be acquired for the WLAN measured;

- 3> set connectedWLAN to TRUE if the UE is connected to the WLAN measured;
- 3> if *reportQuantityWLAN* exists within the *ReportConfigInterRAT* within the *VarMeasConfig* for this *measId*:
 - 4> if *bandRequestWLAN* is set to *TRUE*:

5> set *bandWLAN* to include WLAN band of the WLAN measured;

- 4> if *carrierInfoRequestWLAN* is set to *TRUE*:
 - 5> set carrierInfoWLAN to include WLAN carrier information of the WLAN measured if it can be acquired;
- 4> if availableAdmissionCapacityRequestWLAN is set to TRUE:

5> set the *measResult* to include *avaiableAdmissionCapacityWLAN* if it can be acquired;

4> if backhaulDL-BandwidthRequestWLAN is set to TRUE:

5> set the measResult to include backhaulDL-BandwidthWLAN if it can be acquired;

4> if *backhaulUL-BandwidthRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *backhaulUL-BandwidthWLAN* if it can be acquired;

4> if *channelUtilizationRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *channelUtilizationWLAN* if it can be acquired;

4> if *stationCountRequestWLAN* is set to *TRUE*:

5> set the *measResult* to include *stationCountWLAN* if it can be acquired;

- 1> if the UE is configured with NE-DC:
 - 2> submit the *MeasurementReport* message via SRB1 embedded in NR RRC message ULInformationTransferMRDC as specified in TS 38.331 [82].

1> else:

2> submit the *MeasurementReport* message to lower layers for transmission, upon which the procedure ends;

5.5.5.2 Determination of available NR measurement results

When configured to report measurement results of the serving and the best neighbouring cells on NR serving frequencies, the UE shall consider NR measurement results to be available as follows:

- 1> only SSB based results are available and only if configured to measure these for the concerned serving frequency;
- 1> for the serving cell:
 - 2> include cell quantities RSRP and RSRQ while SINR is included if the UE is configured to measure this quantity on an NR frequency, possibly different from the concerned serving frequency, but only if configured by NR measConfig:
 - 2> include beam results and beam quantities if the UE is configured to measure these on an NR frequency, possibly different from the concerned serving frequency, but only if configured by NR *measConfig*;
- 1> for a neighbouring cell:
 - 2> include cell quantities, beam results and beam quantities if the UE is configured to measure these on an NR frequency, possibly different from the concerned serving frequency, but only if configured by NR measConfig.

1> filter available results according to the applicable field in NR quantityConfig:

5.5.5.3 Selection of NR sorting quality

When configured to report the best cells or beams, the UE shall determine the quantity that is used to order and select as follows:

- 1> for cells on the frequency associated with the *measId* that triggered the measurement reporting, if the *reportTrigger* is set to *event*, consider the quantity used in *bN-ThresholdYNR* to be the sorting quantity;
- 1> for other cases, determine the sorting quantity as follows:
 - 2> consider the following quantities as candidate sorting quantities:
 - 3> for cells on the frequency associated with the *measId* that triggered the measurement reporting (for a *triggerType* set to *periodical*):
 - 4> the quantities defined by *reportQuantityCellNR*, when used for sorting cells;
 - 4> the quantities defined by *reportQuantityRS-IndexNR*, when used for sorting beams;
 - 3> for cells, serving or non-serving (i.e. within *reportAddNeighMeas*), on NR serving frequencies other than the one associated with the *measId* triggering reporting:
 - 4> the available quantities of available NR measurement results as specified in 5.5.5.2;
 - 2> if there is a single candidate sorting quantity;
 - 3> consider the concerned quantity to be the sorting quantity;

2> else:

3> if RSRP is one of the candidate sorting quantities;

4> consider RSRP to be the sorting quantity;

3> else:

4> consider RSRQ to be the sorting quantity;

5.5.6 Measurement related actions

5.5.6.1 Actions upon handover and re-establishment

E-UTRAN applies the handover procedure as follows:

- when performing the handover procedure, as specified in 5.3.5.4, ensure that a *measObjectId* corresponding to each handover target serving frequency is configured as a result of the procedures described in this sub-clause and in 5.3.5.4;
- when changing the band while the physical frequency remains unchanged, E-UTRAN releases the *measObject* corresponding to the source frequency and adds a *measObject* corresponding to the target frequency (i.e. it does not reconfigure the *measObject*);

E-UTRAN applies the re-establishment procedure as follows:

- when performing the connection re-establishment procedure, as specified in 5.3.7, ensure that a *measObjectId* corresponding each target serving frequency is configured as a result of the procedure described in this subclause and the subsequent connection reconfiguration procedure immediately following the re-establishment procedure;
- in the first reconfiguration following the re-establishment when changing the band while the physical frequency remains unchanged, E-UTRAN releases the *measObject* corresponding to the source frequency and adds a *measObject* corresponding to the target frequency (i.e. it does not reconfigure the *measObject*);

The UE shall:

- 1> for each *measId* included in the *measIdList* within *VarMeasConfig*:
 - 2> if the *triggerType* is set to *periodical*:
 - 3> remove this *measId* from the *measIdList* within *VarMeasConfig*:
- 1> if the procedure was triggered due to a handover or successful re-establishment and the procedure involves a change of primary frequency, update the *measId* values in the *measIdList* within *VarMeasConfig* as follows:
 - 2> if a *measObjectId* value corresponding to the target primary frequency exists in the *measObjectList* within *VarMeasConfig*:
 - 3> for each *measId* value in the *measIdList*:
 - 4> if the *measId* value is linked to the *measObjectId* value corresponding to the source primary frequency:
 - 5> link this *measId* value to the *measObjectId* value corresponding to the target primary frequency;
 - 4> else if the *measId* value is linked to the *measObjectId* value corresponding to the target primary frequency:
 - 5> link this *measId* value to the *measObjectId* value corresponding to the source primary frequency;

2> else:

- 3> remove all *measId* values that are linked to the *measObjectId* value corresponding to the source primary frequency;
- 1> remove all measurement reporting entries within VarMeasReportList;
- 1> stop the periodical reporting timer or timer T321, whichever one is running, as well as associated information (e.g. *timeToTrigger*) for all *measId*;
- 1> release the measurement gaps (configured by E-UTRA RRC), if activated;
- NOTE: If the UE requires measurement gaps to perform inter-frequency or inter-RAT measurements, the UE resumes the inter-frequency and inter-RAT measurements after the E-UTRAN has setup the measurement gaps.

5.5.6.2 Speed dependant scaling of measurement related parameters

The UE shall adjust the value of the following parameter configured by the E-UTRAN depending on the UE speed: *timeToTrigger*. The UE shall apply 3 different levels, which are selected as follows:

The UE shall:

- 1> perform mobility state detection using the mobility state detection as specified in TS 36.304 [4] with the following modifications:
 - 2> counting handovers instead of cell reselections;
 - 2> applying the parameter applicable for RRC_CONNECTED as included in *speedStatePars* within *VarMeasConfig*;
- 1> if high mobility state is detected:

2> use the *timeToTrigger* value multiplied by *sf-High* within *VarMeasConfig*;

1> else if medium mobility state is detected:

2> use the *timeToTrigger* value multiplied by *sf-Medium* within *VarMeasConfig*;

1> else:

2> no scaling is applied;

5.5.7 Inter-frequency RSTD measurement indication

5.5.7.1 General



Figure 5.5.7.1-1: Inter-frequency RSTD measurement indication

The purpose of this procedure is to indicate to the network that the UE is going to start/stop OTDOA inter-frequency RSTD measurements which require measurement gaps as specified in TS 36.133 [16], clause 8.1.2.6. The procedure is also used to indicate to the network that the UE is going to start/stop OTDOA intra-frequency RSTD measurements which require measurement gaps. This procedure is also used to indicate to the network that the category M1 or M2 UE prefers to perform RSTD measurements with dense PRS configuration, as specified in TS 36.133 [16], Table 8.1.2.1-3.

NOTE: It is a network decision to configure the measurement gap.

5.5.7.2 Initiation

The UE shall:

- 1> if and only if upper layers indicate to start performing inter-frequency RSTD measurements and the UE requires measurement gaps for these measurements while measurement gaps are either not configured or not sufficient:
 - 2> initiate the procedure to indicate start;
- NOTE 1: The UE verifies the measurement gap situation only upon receiving the indication from upper layers. If at this point in time sufficient gaps are available, the UE does not initiate the procedure. Unless it receives a new indication from upper layers, the UE is only allowed to further repeat the procedure in the same PCell once per frequency if the provided measurement gaps are insufficient.
- 1> if and only if upper layers indicate to stop performing inter-frequency RSTD measurements:

2> initiate the procedure to indicate stop;

NOTE 2: The UE may initiate the procedure to indicate stop even if it did not previously initiate the procedure to indicate start.

5.5.7.3 Actions related to transmission of *InterFreqRSTDMeasurementIndication* message

- The UE shall set the contents of InterFreqRSTDMeasurementIndication message as follows:
 - 1> if the procedure is initiated to indicate start or stop of inter-frequency RSTD measurements:
 - 2> set the *rstd-InterFreqIndication* as follows:
 - 3> if the procedure is initiated to indicate start of inter-frequency RSTD measurements:
 - 4> set the *rstd-InterFreqInfoList* according to the information received from upper layers;
 - 4> for category M1 or M2 UE, if the procedure is initated to indicate the measurement gap that the UE prefers to perform RSTD measurements with dense PRS configuration:

5> set the *measPRS-Offset-r15* according to the UE preference;

- 3> else if the procedure is initiated to indicate stop of inter-frequency RSTD measurements:
 - 4> set the *rstd-InterFreqIndication* to the value *stop*;

```
1> else:
```

- 2> set the *rstd-InterFreqIndication* as follows:
 - 3> if the procedure is initiated to indicate start of intra-frequency RSTD measurements:
 - 4> set the *carrierFreq* in the *rstd-InterFreqInfoList* to the carrier frequency of the serving cell;
 - 4> for category M1 or M2 UE, if the procedure is initated to indicate the measurement gap that the UE prefers to perform RSTD measurements with dense PRS configuration:
 - 5> set the *measPRS-Offset-r15* according to the UE preference;
 - 3> else if the procedure is initiated to indicate stop of intra-frequency RSTD measurements:
 - 4> set the *rstd-InterFreqIndication* to the value *stop*;
- 1> submit the *InterFreqRSTDMeasurementIndication* message to lower layers for transmission, upon which the procedure ends;

5.6 Other

5.6.0 General

For NB-IoT, only a subset of the procedures described in this sub-clause apply.

Table 5.6.0-1 specifies the procedures that are applicable to NB-IoT. All other procedures are not applicable to NB-IoT; this is not further stated in the corresponding procedures.

Table 5.6.0-1: "Other" Procedures applicable to a NB-IoT UE

Sub-clause	Procedures
5.6.1	DL information transfer
5.6.2	UL information transfer
5.6.3	UE Capability transfer

5.6.1 DL information transfer

5.6.1.1 General

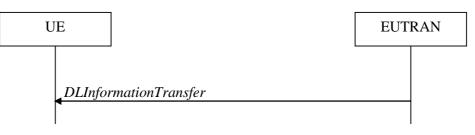


Figure 5.6.1.1-1: DL information transfer

The purpose of this procedure is to transfer NAS, (tunnelled) non-3GPP dedicated information or time reference information from E-UTRAN to a UE in RRC_CONNECTED.

5.6.1.2 Initiation

E-UTRAN initiates the DL information transfer procedure whenever there is a need to transfer NAS, non-3GPP dedicated information or time reference information. E-UTRAN initiates the DL information transfer procedure by sending the *DLInformationTransfer* message.

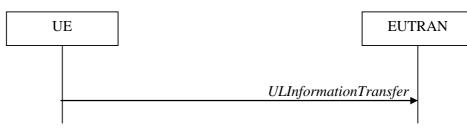
5.6.1.3 Reception of the *DLInformationTransfer* by the UE

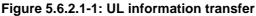
Upon receiving DLInformationTransfer message, the UE shall:

- 1> if the UE is a NB-IoT UE; or
- 1> if the *dedicatedInfoType* is present and set to *dedicatedInfoNAS*:
 - 2> forward the *dedicatedInfoNAS* to the NAS upper layers.
- 1> if the *dedicatedInfoType* is present and set to *dedicatedInfoCDMA2000-1XRTT* or to *dedicatedInfoCDMA2000-HRPD*:
 - 2> forward the *dedicatedInfoCDMA2000* to the CDMA2000 upper layers;
- 1> if *timeReferenceInfo* is included:
 - 2> calculate the time reference based on the included *time*, *timeInfoType* and *referenceSFN* in *timeReferenceInfo*;
 - 2> calculate the inaccuracy of the time reference based on the *uncertainty* and other implementation-related inaccuracies, if *uncertainty* is included in *timeReferenceInfo*;
 - 2> inform upper layers of the time reference and, if *uncertainty* is included in *timeReferenceInfo*, of the inaccuracy of the time reference.

5.6.2 UL information transfer

5.6.2.1 General





The purpose of this procedure is to transfer NAS or (tunnelled) non-3GPP dedicated information from the UE to E-UTRAN.

5.6.2.2 Initiation

A UE in RRC_CONNECTED initiates the UL information transfer procedure whenever there is a need to transfer NAS or non-3GPP dedicated information, except at RRC connection establishment or resume in which case the NAS information is piggybacked to the *RRCConnectionSetupComplete* or *RRCConnectionResumeComplete* message correspondingly. The UE initiates the UL information transfer procedure by sending the *ULInformationTransfer* message. When CDMA2000 information has to be transferred, the UE shall initiate the procedure only if SRB2 is established.

5.6.2.3 Actions related to transmission of ULInformationTransfer message

The UE shall set the contents of the ULInformationTransfer message as follows:

1> if there is a need to transfer NAS information:

2> if the UE is a NB-IoT UE:

3> set the *dedicatedInfoNAS* to include the information received from upper layers;

- 2> else, set the *dedicatedInfoType* to include the *dedicatedInfoNAS*;
- 1> if there is a need to transfer CDMA2000 1XRTT information:
 - 2> set the *dedicatedInfoType* to include the *dedicatedInfoCDMA2000-1XRTT*;
- 1> if there is a need to transfer CDMA2000 HRPD information:
 - 2> set the *dedicatedInfoType* to include the *dedicatedInfoCDMA2000-HRPD*;
- 1> upon RRC connection establishment, if UE supports the Control Plane CIoT EPS optimisation and UE does not need UL gaps during continuous uplink transmission:
 - 2> configure lower layers to stop using UL gaps during continuous uplink transmission in FDD for ULInformationTransfer message and subsequent uplink transmission in RRC_CONNECTED except for UL transmissions as specified in TS 36.211 [21];
- 1> submit the ULInformationTransfer message to lower layers for transmission, upon which the procedure ends;

5.6.2.4 Failure to deliver ULInformationTransfer message

The UE shall:

- 1> if the UE is a NB-IoT UE, AS security is not started and radio link failure occurs before the successful delivery of *ULInformationTransfer* messages has been confirmed by lower layers; or
- 1> if mobility (i.e. handover, RRC connection re-establishment) occurs before the successful delivery of *ULInformationTransfer* messages has been confirmed by lower layers:
 - 2> inform upper layers about the possible failure to deliver the information contained in the concerned ULInformationTransfer messages;

5.6.2a UL information transfer for MR-DC

5.6.2a.1 General

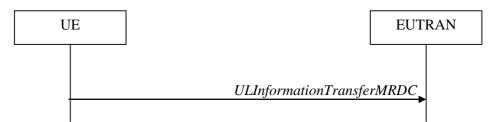


Figure 5.6.2a.1-1: UL information transfer MR-DC

The purpose of this procedure is to transfer from the UE to E-UTRAN MR-DC dedicated information e.g. the NR RRC Measurement Report message.

5.6.2a.2 Initiation

A UE in RRC_CONNECTED initiates the UL information transfer procedure whenever there is a need to transfer MR DC dedicated information as specified in TS 38.331 [82]. I.e. the procedure is not used during an RRC connection reconfiguration involving NR connection reconfiguration, in which case the MR DC information is piggybacked to the *RRCConnectionReconfigurationComplete* message.

5.6.2a.3 Actions related to transmission of ULInformationTransferMRDC message

The UE shall set the contents of the ULInformationTransferMRDC message as follows:

1> if there is a need to transfer MR DC dedicated information:

2> set the *ul-DCCH-MessageNR* to include the MR DC dedicated information to be transferred;

- 1> submit the *ULInformationTransferMRDC* message to lower layers for transmission, upon which the procedure ends;
- 5.6.2a.4 Void

5.6.3 UE capability transfer

5.6.3.1 General

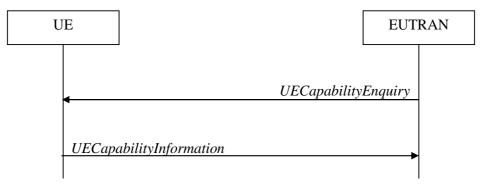


Figure 5.6.3.1-1: UE capability transfer

The purpose of this procedure is to transfer UE radio access capability information from the UE to E-UTRAN.

If the UE has changed its E-UTRAN radio access capabilities, the UE shall request higher layers to initiate the necessary NAS procedures (see TS 23.401 [41]) that would result in the update of UE radio access capabilities using a new RRC connection.

NOTE: Change of the UE's GERAN UE radio capabilities in RRC_IDLE is supported by use of Tracking Area Update.

5.6.3.2 Initiation

E-UTRAN initiates the procedure to a UE in RRC_CONNECTED when it needs (additional) UE radio access capability information.

5.6.3.3 Reception of the UECapabilityEnquiry by the UE

The UE shall:

- 1> for NB-IoT, set the contents of UECapabilityInformation message as follows:
 - 2> include the UE Radio Access Capability Parameters within the *ue-Capability*;
 - 2> include ue-RadioPagingInfo;
 - 2> submit the UECapabilityInformation message to lower layers for transmission, upon which the procedure ends;

1> else, set the contents of UECapabilityInformation message as follows:

2> if the *ue-CapabilityRequest* includes *eutra*:

- 3> include the UE-EUTRA-Capability within a ue-CapabilityRAT-Container and with the rat-Type set to eutra;
- 3> if the UE supports FDD and TDD:
 - 4> set all fields of UECapabilityInformation, except field fdd-Add-UE-EUTRA-Capabilities and tdd-Add-UE-EUTRA-Capabilities (including their sub-fields), to include the values applicable for both FDD and TDD (i.e. functionality supported by both modes);
 - 4> if (some of) the UE capability fields have a different value for FDD and TDD:
 - 5> if for FDD, the UE supports additional functionality compared to what is indicated by the previous fields of *UECapabilityInformation*:
 - 6> include field *fdd-Add-UE-EUTRA-Capabilities* and set it to include fields reflecting the additional functionality applicable for FDD;
 - 5> if for TDD, the UE supports additional functionality compared to what is indicated by the previous fields of *UECapabilityInformation*:
 - 6> include field *tdd-Add-UE-EUTRA-Capabilities* and set it to include fields reflecting the additional functionality applicable for TDD;
- NOTE 1: The UE includes fields of XDD-Add-UE-EUTRA-Capabilities in accordance with the following:
 - The field is included only if one or more of its sub-fields (or bits in the feature group indicators string) has a value that is different compared to the value signalled elsewhere within *UE-EUTRA-Capability*;
 - (this value signalled elsewhere is also referred to as the *Common value*, that is supported for both XDD modes)
 - For the fields that are included in XDD-Add-UE-EUTRA-Capabilities, the UE sets:
 - the sub-fields (or bits in the feature group indicators string) that are not allowed to be different to the same value as the *Common value*;
 - the sub-fields (or bits in the feature group indicators string) that are allowed to be different to a value indicating at least the same functionality as indicated by the *Common value*;
 - 3> else (UE supports single xDD mode):
 - 4> set all fields of UECapabilityInformation, except field fdd-Add-UE-EUTRA-Capabilities and tdd-Add-UE-EUTRA-Capabilities (including their sub-fields), to include the values applicable for the xDD mode supported by the UE;
 - 3> compile a list of band combinations, candidate for inclusion in the UECapabilityInformation message, comprising of band combinations supported by the UE according to the following priority order (i.e. listed in order of decreasing priority):
 - 4> include all non-CA bands, regardless of whether UE supports carrier aggregation, only:
 - if the UE includes ue-Category-v1020 (i.e. indicating category 6 to 8); or
 - if for at least one of the non-CA bands, the UE supports more MIMO layers with TM9 and TM10 than implied by the UE category; or
 - if the UE supports TM10 with one or more CSI processes; or
 - if the UE supports 1024QAM in DL;
 - 4> if the UECapabilityEnquiry message includes requestedFrequencyBands and UE supports requestedFrequencyBands:
 - 5> include all 2DL+1UL CA band combinations, only consisting of bands included in *requestedFrequencyBands*;
 - 5> include all other CA band combinations, only consisting of bands included in *requestedFrequencyBands*, and prioritized in the order of *requestedFrequencyBands*, (i.e. first

include remaining band combinations containing the first-listed band, then include remaining band combinations containing the second-listed band, and so on);

4> else (no requested frequency bands):

5> include all 2DL+1UL CA band combinations;

- 5> include all other CA band combinations;
- 4> if UE supports *maximumCCsRetrieval* and if the *UECapabilityEnquiry* message includes the *requestedMaxCCsDL* and the *requestedMaxCCsUL* (i.e. both UL and DL maximums are given):
 - 5> remove from the list of candidates the band combinations for which the number of CCs in DL exceeds the value indicated in the *requestedMaxCCsDL* or for which the number of CCs in UL exceeds the value indicated in the *requestedMaxCCsUL*;
 - 5> indicate in *requestedCCsUL* the same value as received in *requestedMaxCCsUL*;
 - 5> indicate in *requestedCCsDL* the same value as received in *requestedMaxCCsDL*;
- 4> else if UE supports maximumCCsRetrieval and if the UECapabilityEnquiry message includes the requestedMaxCCsDL (i.e. only DL maximum limit is given):
 - 5> remove from the list of candidates the band combinations for which the number of CCs in DL exceeds the value indicated in the *requestedMaxCCsDL*;
 - 5> indicate value in *requestedCCsDL* the same value as received in *requestedMaxCCsDL*;
- 4> else if UE supports maximumCCsRetrieval and if the UECapabilityEnquiry message includes the requestedMaxCCsUL (i.e. only UL maximum limit is given):
 - 5> remove from the list of candidates the band combinations for which the number of CCs in UL exceeds the value indicated in the *requestedMaxCCsUL*;
 - 5> indicate in *requestedCCsUL* the same value as received in *requestedMaxCCsUL*;
- 4> if the UE supports reducedIntNonContComb and the UECapabilityEnquiry message includes requestReducedIntNonContComb:
 - 5> set reducedIntNonContCombRequested to true;
 - 5> remove from the list of candidates the intra-band non-contiguous CA band combinations which support is implied by another intra-band non-contiguous CA band combination included in the list of candidates as specified in TS 36.306 [5], clause 4.3.5.21:
- 4> if the UE supports requestReducedFormat and UE supports skipFallbackCombinations and UECapabilityEnquiry message includes requestSkipFallbackComb:
 - 5> set *skipFallbackCombRequested* to true;
 - 5> for each band combination included in the list of candidates (including 2DL+1UL CA band combinations), starting with the ones with the lowest number of DL and UL carriers, that concerns a fallback band combination of another band combination included in the list of candidates as specified in TS 36.306 [5]:
 - 6> remove the band combination from the list of candidates;
 - 6> include *differentFallbackSupported* in the band combination included in the list of candidates whose fallback concerns the removed band combination, if its capabilities differ from the removed band combination;
- 4> if the UE supports *requestReducedFormat* and *diffFallbackCombReport*, and *UECapabilityEnquiry* message includes *requestDiffFallbackCombList*:
 - 5> if the UE does not support skipFallbackCombinations or UECapabilityEnquiry message does not include requestSkipFallbackComb:

6> remove all band combination from the list of candidates;

- 5> for each CA band combination indicated in *requestDiffFallbackCombList*:
 - 6> include the CA band combination, if not already in the list of candidates;
 - 6> include the fallback combinations for which the supported UE capabilities are different from the capability of the CA band combination;
- 5> include CA band combinations indicated in *requestDiffFallbackCombList* into *requestedDiffFallbackCombList*;
- 3> if the UECapabilityEnquiry message includes requestReducedFormat and UE supports requestReducedFormat:
 - 4> include in *supportedBandCombinationReduced* as many as possible of the band combinations included in the list of candidates, including the non-CA combinations, determined according to the rules and priority order defined above;

3> else

- 4> if the UECapabilityEnquiry message includes requestedFrequencyBands and UE supports requestedFrequencyBands:
 - 5> include in *supportedBandCombination* as many as possible of the band combinations included in the list of candidates, including the non-CA combinations and up to 5DL+5UL CA band combinations, determined according to the rules and priority order defined above;
 - 5> include in *supportedBandCombinationAdd* as many as possible of the remaining band combinations included in the list of candidates, (i.e. the candidates not included in *supportedBandCombination*), up to 5DL+5UL CA band combinations, determined according to the rules and priority order defined above;
- 4 > else
 - 5> include in *supportedBandCombination* as many as possible of the band combinations included in the list of candidates, including the non-CA combinations and up to 5DL+5UL CA band combinations, determined according to the rules defined above;
 - 5> if it is not possible to include in *supportedBandCombination* all the band combinations to be included according to the above, selection of the subset of band combinations to be included is left up to UE implementation;
- 3> indicate in *requestedBands* the same bands and in the same order as included in *requestedFrequencyBands*, if received;
- 3> if the UE is a category 0, M1 or M2 UE, or supports any UE capability information in ue-RadioPagingInfo, according to TS 36.306 [5]:
 - 4> include *ue-RadioPagingInfo* and set the fields according to TS 36.306 [5];
- 3> if the UE supports (NG)EN-DC or NE-DC and if *requestedFreqBandsNR-MRDC* is included in the request:
 - 4> include into *featureSetsEUTRA* the feature sets that are applicable for the received *requestedFreqBandsNR-MRDC* and *requestedCapabilityCommon* as specified in TS 38.331 [82], clause 5.6.1.4.
- NOTE 2: The network must include the *requestedFreqBandsNR-MRDC* in order to obtain feature sets for E-UTRA and MR-DC.
- NOTE 3: Even if the network requests (only) capabilities for *eutra*, it may include NR band numbers in the *requestedFreqBandsNR-MRDC* in order to ensure that the UE includes all necessary feature sets (i.e. E-UTRA and NR) needed for subsequently requested *eutra-nr* capabilities.

- 3> if the UECapabilityEnquiry message includes requestSTTI-SPT-Capability and if the UE supports short TTI and/or SPT (i.e., sTTI-SPT-Supported):
 - 4> for each band combination the UE included in a field of the *UECapabilityInformation* message in accordance with the previous:
 - 5> if the UE supports short TTI, include the short TTI capabilities for each of the band combinations using the *stti-SPT-BandParameters*;
 - 5> if the UE supports SPT, include the SPT capabilities for each of the band combinations using the *stti-SPT-BandParameters*;
- NOTE 4: The UE may have to add/repeat the band combinations to the list of band combinations included earlier, to include short TTI capabilities and/or SPT capabilities.
 - 2> if the ue-CapabilityRequest includes geran-cs and if the UE supports GERAN CS domain:
 - 3> include the UE radio access capabilities for GERAN CS within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *geran-cs*;
 - 2> if the ue-CapabilityRequest includes geran-ps and if the UE supports GERAN PS domain:
 - 3> include the UE radio access capabilities for GERAN PS within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *geran-ps*;
 - 2> if the *ue-CapabilityRequest* includes *utra* and if the UE supports UTRA:
 - 3> include the UE radio access capabilities for UTRA within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *utra*;
 - 2> if the ue-CapabilityRequest includes cdma2000-1XRTT and if the UE supports CDMA2000 1xRTT:
 - 3> include the UE radio access capabilities for CDMA2000 within a *ue-CapabilityRAT-Container* and with the *rat-Type* set to *cdma2000-1XRTT*;
 - 2> if the *ue-CapabilityRequest* includes *nr* and if the UE supports NR:
 - 3> include the UE radio access capabilities for NR within a *ue-CapabilityRAT-Container*, with the *rat-Type* set to *nr*;
 - 3> include band combinations and feature sets as specified in TS 38.331 [82], clause 5.6.1.4, considering the included requestedFreqBandsNR-MRDC, requestedCapabilityNR, the eutra-nr-only flag and requestedCapabilityCommon (if present);
 - 2> if the *ue-CapabilityRequest* includes *eutra-nr* and if the UE supports (NG)EN-DC or NE-DC:
 - 3> include the UE radio access capabilities for EUTRA-NR within a ue-CapabilityRAT-Container, with the rat-Type set to eutra-nr;
 - 3> include band combinations as specified in TS 38.331 [82], clause 5.6.1.4, considering the included requestedFreqBandsNR-MRDC, requestedCapabilityNR (if present) and requestedCapabilityCommon (if included);

1> submit the UECapabilityInformation message to lower layers for transmission, upon which the procedure ends;

5.6.4 CSFB to 1x Parameter transfer

5.6.4.1 General

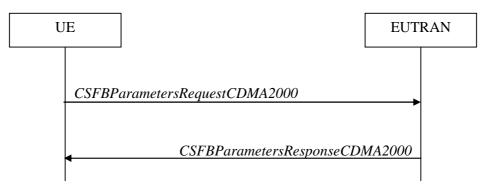


Figure 5.6.4.1-1: CSFB to 1x Parameter transfer

The purpose of this procedure is to transfer the CDMA2000 1xRTT parameters required to register the UE in the CDMA2000 1xRTT network for CSFB support.

5.6.4.2 Initiation

A UE in RRC_CONNECTED initiates the CSFB to 1x parameter transfer procedure upon request from the CDMA2000 upper layers. The UE initiates the CSFB to 1x parameter transfer procedure by sending the *CSFBParametersRequestCDMA2000* message.

5.6.4.3 Actions related to transmission of CSFBParametersRequestCDMA2000 message

The UE shall:

1> submit the *CSFBParametersRequestCDMA2000* message to lower layers for transmission using the current configuration;

5.6.4.4 Reception of the CSFBParametersResponseCDMA2000 message

Upon reception of the CSFBParametersResponseCDMA2000 message, the UE shall:

1> forward the *rand* and the *mobilityParameters* to the CDMA2000 1xRTT upper layers;

5.6.5 UE Information

5.6.5.1 General

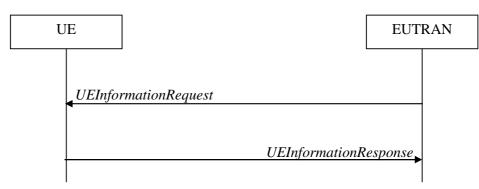


Figure 5.6.5.1-1: UE information procedure

The UE information procedure is used by E-UTRAN to request the UE to report information.

5.6.5.2 Initiation

E-UTRAN initiates the procedure by sending the *UEInformationRequest* message. E-UTRAN should initiate this procedure only after successful security activation.

5.6.5.3 Reception of the UEInformationRequest message

Upon receiving the UEInformationRequest message, the UE shall, only after successful security activation:

- 1> if *rach-ReportReq* is set to *true*, set the contents of the *rach-Report* in the *UEInformationResponse* message as follows:
 - 2> set the *numberOfPreamblesSent* to indicate the number of preambles sent by MAC for the last successfully completed random access procedure;
 - 2> if contention resolution was not successful as specified in TS 36.321 [6] for at least one of the transmitted preambles for the last successfully completed random access procedure:

3> set the *contentionDetected* to *true*;

2> else:

3> set the *contentionDetected* to *false*;

- 1> if *rlf-ReportReq* is set to *true* and the UE has radio link failure information or handover failure information available in *VarRLF-Report* and if the RPLMN is included in *plmn-IdentityList* stored in *VarRLF-Report*:
 - 2> set *timeSinceFailure* in *VarRLF-Report* to the time that elapsed since the last radio link or handover failure in E-UTRA;
 - 2> set the *rlf-Report* in the UEInformationResponse message to the value of *rlf-Report* in VarRLF-Report;
 - 2> discard the *rlf-Report* from *VarRLF-Report* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> if *connEstFailReportReq* is set to *true* and the UE has connection establishment failure information in *VarConnEstFailReport* and if the RPLMN is equal to *plmn-Identity* stored in *VarConnEstFailReport*:
 - 2> set *timeSinceFailure* in *VarConnEstFailReport* to the time that elapsed since the last connection establishment failure in E-UTRA;
 - 2> set the connEstFailReport in the UEInformationResponse message to the value of connEstFailReport in VarConnEstFailReport;
 - 2> discard the connEstFailReport from VarConnEstFailReport upon successful delivery of the UEInformationResponse message confirmed by lower layers;
- 1> if the logMeasReportReq is present and if the RPLMN is included in plmn-IdentityList stored in VarLogMeasReport:
 - 2> if *VarLogMeasReport* includes one or more logged measurement entries, set the contents of the *logMeasReport* in the *UEInformationResponse* message as follows:
 - 3> include the *absoluteTimeStamp* and set it to the value of *absoluteTimeInfo* in the *VarLogMeasReport*;
 - 3> include the *traceReference* and set it to the value of *traceReference* in the *VarLogMeasReport*;
 - 3> include the traceRecordingSessionRef and set it to the value of traceRecordingSessionRef in the VarLogMeasReport;
 - 3> include the *tce-Id* and set it to the value of *tce-Id* in the *VarLogMeasReport*;
 - 3> include the *logMeasInfoList* and set it to include one or more entries from *VarLogMeasReport* starting from the entries logged first;
 - 3> if the *VarLogMeasReport* includes one or more additional logged measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:

4> include the *logMeasAvailable*;

- 3> if the *VarLogMeasReport* includes one or more additional logged Bluetooth measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailableBT*;
- 3> if the *VarLogMeasReport* includes one or more additional logged WLAN measurement entries that are not included in the *logMeasInfoList* within the *UEInformationResponse* message:
 - 4> include the *logMeasAvailableWLAN*;
- 1> if *mobilityHistoryReportReq* is set to *true*:
 - 2> include the *mobilityHistoryReport* and set it to include entries from *VarMobilityHistoryReport*;
 - 2> include in the *mobilityHistoryReport* an entry for the current cell, possibly after removing the oldest entry if required, and set its fields as follows:
 - 3> set *visitedCellId* to the global cell identity of the current cell:
 - 3> set field *timeSpent* to the time spent in the current cell;
- 1> if the *idleModeMeasurementReq* is included in the *UEInformationRequest* and UE has stored *VarMeasIdleReport*:
 - 2> set the measResultListIdle in the UEInformationResponse message to the value of measReportIdle in the VarMeasIdleReport;
 - 2> discard the VarMeasIdleReport upon successful delivery of the UEInformationResponse message confirmed by lower layers;
- 1> if *flightPathInfoReq* field is present and the UE has flight path information available:
 - 2> include the *flightPathInfoReport* and set it to include the list of waypoints along the flight path;
 - 2> if the *includeTimeStamp* is set to TRUE:
 - 3> set the field *timeStamp* to the time when UE intends to arrive to each waypoint if this information is available at the UE;
- 1> if the *logMeasReport* is included in the *UEInformationResponse*:
 - 2> submit the UEInformationResponse message to lower layers for transmission via SRB2;
 - 2> discard the logged measurement entries included in the *logMeasInfoList* from *VarLogMeasReport* upon successful delivery of the *UEInformationResponse* message confirmed by lower layers;
- 1> else:
 - 2> submit the UEInformationResponse message to lower layers for transmission via SRB1;

5.6.6 Logged Measurement Configuration

5.6.6.1 General

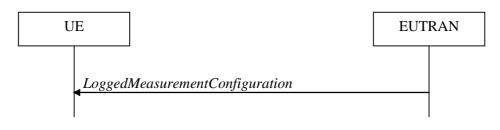


Figure 5.6.6.1-1: Logged measurement configuration

The purpose of this procedure is to configure the UE to perform logging of measurement results while in RRC_IDLE and to perform logging of measurement results for MBSFN in both RRC_IDLE and RRC_CONNECTED. The procedure applies to logged measurements capable UEs that are in RRC_CONNECTED.

NOTE: E-UTRAN may retrieve stored logged measurement information by means of the UE information procedure.

5.6.6.2 Initiation

E-UTRAN initiates the logged measurement configuration procedure to UE in RRC_CONNECTED by sending the *LoggedMeasurementConfiguration* message.

5.6.6.3 Reception of the *LoggedMeasurementConfiguration* by the UE

Upon receiving the LoggedMeasurementConfiguration message the UE shall:

- l> discard the logged measurement configuration as well as the logged measurement information as specified in 5.6.7;
- 1> store the received loggingDuration, loggingInterval and areaConfiguration, if included, in VarLogMeasConfig;
- 1> if the LoggedMeasurementConfiguration message includes plmn-IdentityList:
 - 2> set plmn-IdentityList in VarLogMeasReport to include the RPLMN as well as the PLMNs included in plmn-IdentityList;

1> else:

2> set *plmn-IdentityList* in *VarLogMeasReport* to include the RPLMN;

- 1> store the received absoluteTimeInfo, traceReference, traceRecordingSessionRef and tce-Id in VarLogMeasReport;
- 1> store the received *targetMBSFN-AreaList*, if included, in *VarLogMeasConfig*;
- 1> store the received *bt-NameList*, if included, in *VarLogMeasConfig*;
- 1> store the received *wlan-Namelist*, if included, in *VarLogMeasConfig*;
- 1> start timer T330 with the timer value set to the *loggingDuration*;

5.6.6.4 T330 expiry

Upon expiry of T330 the UE shall:

1> release VarLogMeasConfig;

The UE is allowed to discard stored logged measurements, i.e. to release *VarLogMeasReport*, 48 hours after T330 expiry.

5.6.7 Release of Logged Measurement Configuration

5.6.7.1 General

The purpose of this procedure is to release the logged measurement configuration as well as the logged measurement information.

5.6.7.2 Initiation

The UE shall initiate the procedure upon receiving a logged measurement configuration in another RAT. The UE shall also initiate the procedure upon power off or detach.

The UE shall:

- 1> stop timer T330, if running;
- 1> if stored, discard the logged measurement configuration as well as the logged measurement information, i.e. release the UE variables *VarLogMeasConfig* and *VarLogMeasReport*;

5.6.8 Measurements logging

5.6.8.1 General

This procedure specifies the logging of available measurements by a UE in RRC_IDLE that has a logged measurement configuration and the logging of available measurements by a UE in both RRC_IDLE and RRC_CONNECTED if *targetMBSFN-AreaList* is included in *VarLogMeasConfig*.

5.6.8.2 Initiation

While T330 is running, the UE shall:

- 1> if measurement logging is suspended:
 - 2> if during the last logging interval the IDC problems detected by the UE is resolved, resume measurement logging;

1> if not suspended, perform the logging in accordance with the following:

- 2> if targetMBSFN-AreaList is included in VarLogMeasConfig:
 - 3> if the UE is camping normally on an E-UTRA cell or is connected to E-UTRA; and
 - 3> if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport*; and
 - 3> if the PCell (in RRC_CONNECTED) or cell where the UE is camping (in RRC_IDLE) is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 4> for MBSFN areas, indicated in *targetMBSFN-AreaList*, from which the UE is receiving MBMS service:
 - 5> perform MBSFN measurements in accordance with the performance requirements as specified in TS 36.133 [16];
- NOTE 1: When configured to perform MBSFN measurement logging by *targetMBSFN-AreaList*, the UE is not required to receive additional MBSFN subframes, i.e. logging is based on the subframes corresponding to the MBMS services the UE is receiving.
 - 5> perform logging at regular time intervals as defined by the *loggingInterval* in *VarLogMeasConfig*, but only for those intervals for which MBSFN measurement results are available as specified in TS 36.133 [16];

2> else if:

- 3> if the UE is in any cell selection state (as specified in TS 36.304 [4]):
 - 4> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
- 3> else if the UE is camping normally on an E-UTRA cell and if the RPLMN is included in *plmn-IdentityList* stored in *VarLogMeasReport* and, if the cell is part of the area indicated by *areaConfiguration* if configured in *VarLogMeasConfig*:
 - 4> perform the logging at regular time intervals, as defined by the *loggingInterval* in *VarLogMeasConfig*;
- 2> when adding a logged measurement entry in *VarLogMeasReport*, include the fields in accordance with the following:
 - 3> if the UE detected IDC problems during the last logging interval:
 - 4> if *measResultServCell* in *VarLogMeasReport* is not empty:
 - 5> include *InDeviceCoexDetected*;
 - 5> suspend measurement logging from the next logging interval;
 - 4> else:
 - 5> suspend measurement logging;
- NOTE 1A: The UE may detect the start of IDC problems as early as Phase 1 as described in clause 23.4 of TS 36.300 [9].
 - 3> set the *relativeTimeStamp* to indicate the elapsed time since the moment at which the logged measurement configuration was received;
 - 3> if detailed location information became available during the last logging interval, set the content of the *locationInfo* as follows:
 - 4> include the *locationCoordinates*;
 - 3> if *wlan-NameList* is included in *VarLogMeasConfig*:
 - 4> if detailed WLAN measurements are available:
 - 5> include *logMeasResultListWLAN*, in order of decreasing RSSI for WLAN APs;
 - 3> if *bt-NameList* is included in *VarLogMeasConfig*:
 - 4> if detailed Bluetooth measurements are available:
 - 5> include *logMeasResultListBT*, in order of decreasing RSSI for Bluetooth beacons;
 - 3> if targetMBSFN-AreaList is included in VarLogMeasConfig:
 - 4> for each MBSFN area, for which the mandatory measurements result fields became available during the last logging interval:
 - 5> set the *rsrpResultMBSFN*, *rsrqResultMBSFN* to include measurement results that became available during the last logging interval;
 - 5> include the fields *signallingBLER-Result* or *dataBLER-MCH-ResultList* if the concerned BLER results are available,
 - 5> set the *mbsfn-AreaId* and *carrierFrequency* to indicate the MBSFN area in which the UE is receiving MBSFN transmission;
 - 4> if in RRC_CONNECTED:
 - 5> set the *servCellIdentity* to indicate global cell identity of the PCell;
 - 5> set the *measResultServCell* to include the layer 3 filtered measured results of the PCell;

5> if available, set the *measResultNeighCells* to include the layer 3 filtered measured results of SCell(s) and neighbouring cell(s) measurements that became available during the last logging interval, in order of decreasing RSRP, for at most the following number of cells: 6 intra-frequency and 3 inter-frequency cells per frequency and according to the following:

6> for each cell included, include the optional fields that are available;

5> if available, optionally set the *measResultNeighCells* to include the layer 3 filtered measured results of neighbouring cell(s) measurements that became available during the last logging interval, in order of decreasing RSCP(UTRA)/RSSI(GERAN)/PilotStrength(cdma2000), for at most the following number of cells: 3 inter-RAT cells per frequency (UTRA, cdma2000)/set of frequencies (GERAN), and according to the following:

6> for each cell included, include the optional fields that are available;

4> if in RRC_IDLE:

5> set the *servCellIdentity* to indicate global cell identity of the serving cell;

- 5> set the *measResultServCell* to include the quantities of the serving cell;
- 5> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements that became available during the last logging interval for at most the following number of neighbouring cells: 6 intra-frequency and 3 inter-frequency neighbours per frequency and according to the following:

6> for each neighbour cell included, include the optional fields that are available;

5> if available, optionally set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell re-selection, to include neighbouring cell measurements that became available during the last logging interval, for at most the following number of cells: 3 inter-RAT cells per frequency (UTRA, cdma2000)/set of frequencies (GERAN), and according to the following:

6> for each cell included, include the optional fields that are available;

- 4> for the cells included according to the previous (i.e. covering previous and current serving cells as well as neighbouring EUTRA cells) include results according to the extended RSRQ if corresponding results are available according to the associated performance requirements defined in TS 36.133 [16];
- 4> for the cells included according to the previous (i.e. covering previous and current serving cells as well as neighbouring EUTRA cells) include RSRQ type if the result was based on measurements using a wider band or using all OFDM symbols;
- NOTE 2: The UE includes the latest results in accordance with the performance requirements as specified in TS 36.133 [16]. E.g. RSRP and RSRQ results are available only if the UE has a sufficient number of results/ receives a sufficient number of subframes during the logging interval.
 - 3> else:
 - 4> if the UE is in any cell selection state (as specified in TS 36.304 [4]):
 - 5> set anyCellSelectionDetected to indicate the detection of no suitable or no acceptable cell found;
 - 5> set the *servCellIdentity* to indicate global cell identity of the last logged cell that the UE was camping on;
 - 5> set the *measResultServCell* to include the quantities of the last logged cell the UE was camping on;

4> else:

- 5> set the *servCellIdentity* to indicate global cell identity of the cell the UE is camping on;
- 5> set the *measResultServCell* to include the quantities of the cell the UE is camping on;
- 4> if available, set the *measResultNeighCells*, in order of decreasing ranking-criterion as used for cell reselection, to include neighbouring cell measurements that became available during the last logging

interval for at most the following number of neighbouring cells: 6 intra-frequency and 3 interfrequency neighbours per frequency as well as 3 inter-RAT neighbours, per frequency/ set of frequencies (GERAN) per RAT and according to the following:

5> for each neighbour cell included, include the optional fields that are available;

- 4> for the cells included according to the previous (i.e. covering previous and current serving cells as well as neighbouring EUTRA cells) include results according to the extended RSRQ if corresponding results are available according to the associated performance requirements defined in TS 36.133 [16];
- 4> for the cells included according to the previous (i.e. covering previous and current serving cells as well as neighbouring EUTRA cells) include RSRQ type if the result was based on measurements using a wider band or using all OFDM symbols;
- NOTE 3: The UE includes the latest results of the available measurements as used for cell reselection evaluation in RRC_IDLE or as used for evaluation of reporting criteria or for measurement reporting according to 5.5.3 in RRC_CONNECTED, which are performed in accordance with the performance requirements as specified in TS 36.133 [16].
 - 2> when the memory reserved for the logged measurement information becomes full, stop timer T330 and perform the same actions as performed upon expiry of T330, as specified in 5.6.6.4;

5.6.9 In-device coexistence indication

5.6.9.1 General

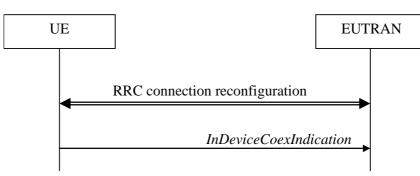


Figure 5.6.9.1-1: In-device coexistence indication

The purpose of this procedure is to inform E-UTRAN about (a change of) the In-Device Coexistence (IDC) problems experienced by the UE in RRC_CONNECTED, as described in TS 36.300 [9], and to provide the E-UTRAN with information in order to resolve them.

5.6.9.2 Initiation

A UE capable of providing IDC indications may initiate the procedure when it is configured to provide IDC indications and upon change of IDC problem information.

Upon initiating the procedure, the UE shall:

- 1> if configured to provide IDC indications:
 - 2> if the UE did not transmit an *InDeviceCoexIndication* message since it was configured to provide IDC indications:
 - 3> if on one or more frequencies for which a *measObjectEUTRA* is configured, the UE is experiencing IDC problems that it cannot solve by itself; or
 - 3> if configured to provide IDC indications for UL CA; and if on one or more supported UL CA combination comprising of carrier frequencies for which a measurement object is configured, the UE is experiencing IDC problems that it cannot solve by itself; or

3> if configured to provide IDC indications for MR-DC, and if on one or more supported MR-DC combination comprising of at least one E-UTRA carrier frequency for which a measurement object is configured and at least one NR carrier frequency included in *candidateServingFreqListNR*, the UE is experiencing IDC problems that it cannot solve by itself:

4> initiate transmission of the InDeviceCoexIndication message in accordance with 5.6.9.3;

2> else:

- 3> if the set of frequencies, for which a *measObjectEUTRA* is configured and on which the UE is experiencing IDC problems that it cannot solve by itself, is different from the set indicated in the last transmitted *InDeviceCoexIndication* message; or
- 3> if for one or more of the frequencies in the previously reported set of frequencies, the *interferenceDirection* is different from the value indicated in the last transmitted *InDeviceCoexIndication* message; or
- 3> if the TDM assistance information is different from the assistance information included in the last transmitted *InDeviceCoexIndication* message; or
- 3> if configured to provide IDC indications for UL CA; and if the *victimSystemType* is different from the value indicated in the last transmitted *InDeviceCoexIndication* message; or
- 3> if configured to provide IDC indications for UL CA; and if the set of supported UL CA combinations on which the UE is experiencing IDC problems that it cannot solve by itself and that the UE includes in *affectedCarrierFreqCombList* according to 5.6.9.3, is different from the set indicated in the last transmitted *InDeviceCoexIndication* message; or
- 3> if configured to provide IDC indications for MR-DC, and if the set of supported MR-DC combinations on which the UE is experiencing IDC problems that it cannot solve by itself and that the UE includes in *affectedCarrierFreqCombListMRDC* according to 5.6.9.3, is different from the set indicated in the last transmitted *InDeviceCoexIndication* message:

4> initiate transmission of the InDeviceCoexIndication message in accordance with 5.6.9.3;

- NOTE 1: The term "IDC problems" refers to interference issues applicable across several subframes/slots where not necessarily all the subframes/slots are affected.
- NOTE 2: For the frequencies on which a serving cell or serving cells is configured that is activated, IDC problems consist of interference issues that the UE cannot solve by itself, during either active data exchange or upcoming data activity which is expected in up to a few hundred milliseconds.
 For frequencies on which a SCell or SCells is configured that is deactivated, reporting IDC problems indicates an anticipation that the activation of the SCell or SCells would result in interference issues that the UE would not be able to solve by itself.
 For a non-serving frequency, reporting IDC problems indicates an anticipation that if the non-serving frequency or frequencies became a serving frequency or serving frequencies then this would result in interference issues that the UE would not be able to solve by itself.

5.6.9.3 Actions related to transmission of InDeviceCoexIndication message

The UE shall set the contents of the InDeviceCoexIndication message as follows:

1> if there is at least one E-UTRA carrier frequency, for which a measurement object is configured, that is affected by IDC problems:

- 2> include the field *affectedCarrierFreqList* with an entry for each affected E-UTRA carrier frequency for which a measurement object is configured;
- 2> for each E-UTRA carrier frequency included in the field affectedCarrierFreqList, include interferenceDirection and set it accordingly;
- 2> include Time Domain Multiplexing (TDM) based assistance information, unless *idc-HardwareSharingIndication* is configured and the UE has no Time Doman Multiplexing based assistance information that could be used to resolve the IDC problems:

3> if the UE has DRX related assistance information that could be used to resolve the IDC problems:

4> include *drx-CycleLength*, *drx-Offset* and *drx-ActiveTime*;

3> else (the UE has desired subframe reservation patterns related assistance information that could be used to resolve the IDC problems):

4> include *idc-SubframePatternList*;

- 3> use the MCG as timing reference if TDM based assistance information regarding the SCG is included;
- 1> if the UE is configured to provide UL CA information and there is a supported UL CA combination comprising of carrier frequencies for which a measurement object is configured, that is affected by IDC problems:
 - 2> include victimSystemType in ul-CA-AssistanceInfo;
 - 2> if the UE sets *victimSystemType* to *wlan* or *Bluetooth*:
 - 3> include affectedCarrierFreqCombList in ul-CA-AssistanceInfo with an entry for each supported UL CA combination comprising of carrier frequencies for which a measurement object is configured, that is affected by IDC problems;

2> else:

- 3> optionally include affectedCarrierFreqCombList in ul-CA-AssistanceInfo with an entry for each supported UL CA combination comprising of carrier frequencies for which a measurement object is configured, that is affected by IDC problems;
- 1> if *idc-HardwareSharingIndication* is configured, and there is at least one E-UTRA carrier frequency, for which a measurement object is configured, the UE is experiencing hardware sharing problems that it cannot solve by itself:

2> include the *hardwareSharingProblem* and set it accordingly;

- 1> if the UE is configured to provide IDC indications for MR-DC and there is a supported MR-DC band combination comprising of at least one E-UTRA carrier frequency for which a measurement object is configured and at least one NR carrier frequency included in *candidateServingFreqListNR*, that is affected by IDC problems; and
- 1> if the IDC problem does not only concern the E-UTRA band combination as the UE already included in *affectedCarrierFreqCombList*:
 - 2> for each entry of affectedCarrierFreqCombInfoListMRDC in mrdc-AssistanceInfo;
 - 3> include victimSystemType;
 - 3> include *interferenceDirection*;
 - 3> if the UE sets *victimSystemType* to *wlan* or *Bluetooth*:
 - 4> include a set of at least one NR carrier frequency included in *candidateServingFreqListNR* and optionally one or more E-UTRA carrier frequency for which a measurement object is configured, that is affected by IDC problems;
 - 3> else:
 - 4> optionally include a set of at least one NR carrier frequency included in *candidateServingFreqListNR* and optionally one or more E-UTRA carrier frequency for which a measurement object is configured, that is affected by IDC problems;
- NOTE 1: When sending an *InDeviceCoexIndication* message to inform E-UTRAN the IDC problems, the UE includes all assistance information (rather than providing e.g. the changed part(s) of the assistance information).
- NOTE 2: Upon not anymore experiencing a particular IDC problem that the UE previously reported, the UE provides an IDC indication with the modified contents of the *InDeviceCoexIndication* message (e.g. by an empty message).

The UE shall submit the InDeviceCoexIndication message to lower layers for transmission.

5.6.10 UE Assistance Information

5.6.10.1 General

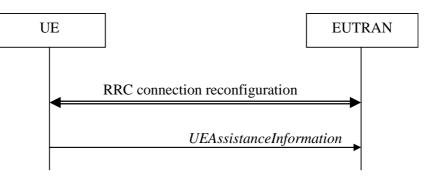


Figure 5.6.10.1-1: UE Assistance Information

The purpose of this procedure is to inform E-UTRAN of the UE's power saving preference and SPS assistance information, maximum PDSCH/PUSCH bandwidth configuration preference, overheating assistance information, or the UE's delay budget report carrying desired increment/decrement in the Uu air interface delay or connected mode DRX cycle length and for BL UEs or UEs in CE of the RLM event ("early-out-of-sync" or "early-in-sync") and RLM information. Upon configuring the UE to provide power preference indications E-UTRAN may consider that the UE does not prefer a configuration primarily optimised for power saving until the UE explicitly indicates otherwise.

5.6.10.2 Initiation

A UE capable of providing power preference indications in RRC_CONNECTED may initiate the procedure in several cases including upon being configured to provide power preference indications and upon change of power preference. A UE capable of providing SPS assistance information in RRC_CONNECTED may initiate the procedure in several cases including upon being configured to provide SPS assistance information and upon change of SPS assistance information.

A UE capable of providing delay budget report in RRC_CONNECTED may initiate the procedure in several cases, including upon being configured to provide delay budget report and upon change of delay budget preference.

A UE capable of CE mode and providing maximum PDSCH/PUSCH bandwidth preference in RRC_CONNECTED may initiate the procedure upon being configured to provide maximum PDSCH/PUSCH bandwidth preference and/or upon change of maximum PDSCH/PUSCH bandwidth preference.

A UE capable of providing overheating assistance information in RRC_CONNECTED may initiate the procedure if it was configured to do so, upon detecting internal overheating, or upon detecting that it is no longer experiencing an overheating condition.

Upon initiating the procedure, the UE shall:

- 1> if configured to provide power preference indications:
 - 2> if the UE did not transmit a *UEAssistanceInformation* message with *powerPrefIndication* since it was configured to provide power preference indications; or
 - 2> if the current power preference is different from the one indicated in the last transmission of the *UEAssistanceInformation* message and timer T340 is not running:

3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;

- 1> if configured to provide maximum PDSCH/PUSCH bandwidth preference:
 - 2> if the UE did not transmit a *UEAssistanceInformation* message with *bw-Preference* since it was configured to provide maximum PDSCH/PUSCH bandwidth preference; or

- 2> if the current maximum PDSCH/PUSCH bandwidth preference is different from the one indicated in the last transmission of the *UEAssistanceInformation* message and timer T341 is not running;
 - 3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;
- 1> if configured to provide SPS assistance information:
 - 2> if the UE did not transmit a *UEAssistanceInformation* message with *sps-AssistanceInformation* since it was configured to provide SPS assistance information; or
 - 2> if the current SPS assistance information is different from the one indicated in the last transmission of the *UEAssistanceInformation* message:
 - 3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;
- 1> if configured to report RLM events:
 - 2> if "early-out-of-sync" event has been detected and T343 is not running; or
 - 2> if "early-in-sync" event has been detected and T344 is not running:
 - 3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;
- 1> if configured to provide delay budget report:
 - 2> if the UE did not transmit a UEAssistanceInformation message with delayBudgetReport since it was configured to provide delay budget report; or
 - 2> if the current delay budget is different from the one indicated in the last transmission of the *UEAssistanceInformation* message and timer T342 is not running:
 - 3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;
- 1> if configured to provide overheating assistance information:
 - 2> if the overheating condition has been detected and T345 is not running; or
 - 2> if the current overheating assistance information is different from the one indicated in the last transmission of the *UEAssistanceInformation* message and timer T345 is not running:
 - 3> initiate transmission of the UEAssistanceInformation message in accordance with 5.6.10.3;

5.6.10.3 Actions related to transmission of UEAssistanceInformation message

The UE shall set the contents of the UEAssistanceInformation message for power preference indications:

- 1> if configured to provide power preference indication and if the UE prefers a configuration primarily optimised for power saving:
 - 2> set *powerPrefIndication* to *lowPowerConsumption*;
- 1> else if configured to provide power preference indication:
 - 2> start or restart timer T340 with the timer value set to the *powerPrefIndicationTimer*;
 - 2> set *powerPrefIndication* to *normal*;

The UE shall set the contents of the UEAssistanceInformation message for SPS assistance information:

- 1> if configured to provide SPS assistance information:
 - 2> if there is any traffic for V2X sidelink communication which needs to report SPS assistance information:

3> include *trafficPatternInfoListSL* in the *UEAssistanceInformation* message;

2> if there is any traffic for uplink communication which needs to report SPS assistance information:

3> include *trafficPatternInfoListUL* in the *UEAssistanceInformation* message;

The UE shall set the contents of the UEAssistanceInformation message for bandwidth preference indications:

1> start timer T341 with the timer value set to the *bw-PreferenceIndicationTimer*;

1> set *bw-Preference* to its preferred configuration;

The UE shall set the contents of the UEAssistanceInformation message for delay budget report:

1> if configured to provide delay budget report:

2> if the UE prefers an adjustment in the connected mode DRX cycle length:

3> set *delayBudgetReport* to *type1* according to a desired value;

2> else if the UE prefers coverage enhancement configuration change:

3> set *delayBudgetReport* to *type2* according to a desired value;

2> start or restart timer T342 with the timer value set to the *delayBudgetReportingProhibitTimer*;

The UE shall set the contents of the UEAssistanceInformation message for the RLM report:

1> if configured to provide RLM report:

- 2> if T314 has expired:
 - 3> set *rlm-event* to *earlyOutOfSync*;
 - 3> start timer T343 with the timer value set to the *rlmReportTimer*:
- 2> if T315 has expired:
 - 3> set *rlm-event* to *earlyInSync*;
 - 3> start timer T344 with the timer value set to the *rlmReportTimer*:
 - 3> if configured to report *rlmReportRep-MPDCCH*:
 - 4> set *excessRep-MPDCCH* to the value indicated by lower layers;

The UE shall set the contents of the UEAssistanceInformation message for overheating assistance indication:

1> if configured to provide overheating assistance indication:

- 2> if the UE experiences internal overheating:
 - 3> if the UE prefers to temporarily reduce its DL category and UL category:
 - 4> include *reducedUE-Category* in the *OverheatingAssistance* IE;
 - 4> set *reducedUE-CategoryDL* to the number to which the UE prefers to temporarily reduce its DL category;
 - 4> set *reducedUE-CategoryUL* to the number to which the UE prefers to temporarily reduce its UL category;
 - 3> if the UE prefers to temporarily reduce the number of maximum secondary component carriers:
 - 4> include *reducedMaxCCs* in the *OverheatingAssistance* IE;
 - 4> set *reducedCCsDL* to the number of maximum SCells the UE prefers to be temporarily configured in downlink;
 - 4> set *reducedCCsUL* to the number of maximum SCells the UE prefers to be temporarily configured in uplink;
 - 3> start timer T345 with the timer value set to the *overheatingIndicationProhibitTimer*;

2> else (if the UE no longer experiences an overheating condition):

3> do not include *reducedUE-Category* and *reducedMaxCCs* in *OverheatingAssistance* IE;

3> start timer T345 with the timer value set to the overheatingIndicationProhibitTimer;

The UE shall submit the UEAssistanceInformation message to lower layers for transmission.

NOTE 1: It is up to UE implementation when and how to trigger SPS assistance information.

NOTE 2: It is up to UE implementation to set the content of *trafficPatternInfoListSL* and *trafficPatternInfoListUL*.

NOTE 3: Traffic patterns for different Destination Layer 2 IDs are provided in different entries in *trafficPatternInfoListSL*.

5.6.11 Mobility history information

5.6.11.1 General

This procedure specifies how the mobility history information is stored by the UE, covering RRC_CONNECTED and RRC_IDLE.

5.6.11.2 Initiation

If the UE supports storage of mobility history information, the UE shall:

- 1> Upon change of cell, consisting of PCell in RRC_CONNECTED or serving cell in RRC_IDLE, to another E-UTRA or inter-RAT cell or when entering out of service:
 - 2> include an entry in variable *VarMobilityHistoryReport* possibly after removing the oldest entry, if necessary, according to following:
 - 3> if the global cell identity of the previous PCell/ serving cell is available:
 - 4> include the global cell identity of that cell in the field *visitedCellId* of the entry;
 - 3> else:
 - 4> include the physical cell identity and carrier frequency of that cell in the field *visitedCellId* of the entry;
 - 3> set the field *timeSpent* of the entry as the time spent in the previous PCell/ serving cell;
- 1> upon entering E-UTRA (in RRC_CONNECTED or RRC_IDLE) while previously out of service and/ or using another RAT:
 - 2> include an entry in variable VarMobilityHistoryReport possibly after removing the oldest entry, if necessary, according to following:
 - 3> set the field *timeSpent* of the entry as the time spent outside E-UTRA;

5.6.12 RAN-assisted WLAN interworking

5.6.12.1 General

The purpose of this procedure is to facilitate access network selection and traffic steering between E-UTRAN and WLAN.

If required by upper layers (see TS 24.312 [66], the UE shall provide an up-to-date set of the applicable parameters provided by *wlan-OffloadConfigCommon* or *wlan-OffloadConfigDedicated* to upper layers, and inform upper layers when no parameters are configured. The parameter set from either *wlan-OffloadConfigCommon* or *wlan-OffloadConfigDedicated* is selected as specified in clauses 5.2.2.24, 5.3.12, 5.6.12.2 and 5.6.12.4.

5.6.12.2 Dedicated WLAN offload configuration

The UE shall:

- 1> if the received *wlan-OffloadInfo* is set to *release*:
 - 2> release *wlan-OffloadConfigDedicated* and *t350*;
 - 2> if the *wlan-OffloadConfigCommon* corresponding to the RPLMN is broadcast by the cell:
 - 3> apply the wlan-OffloadConfigCommon corresponding to the RPLMN included in SystemInformationBlockType17;

1> else:

2> apply the received *wlan-OffloadConfigDedicated*:

5.6.12.3 WLAN offload RAN evaluation

The UE shall:

- 1> if the UE is configured with either wlan-OffloadConfigCommon or wlan-OffloadConfigDedicated; and
- 1> if the UE is in RRC_IDLE or none of *rclwi-Configuration*, *lwa-Configuration* and *lwip-Configuration* is configured:
 - 2> provide measurement results required for the evaluation of the network selection and traffic steering rules as defined in TS 24.312 [66] to upper layers;
 - 2> evaluate the network selection and traffic steering rules as defined in TS 36.304 [4] using WLAN identifiers as indicated in other clauses (either provided in *steerToWLAN* included in *rclwi-Configuration* or in *wlan-Id-List* included in *SystemInformationBlockType17*);

5.6.12.4 T350 expiry or stop

The UE shall:

- 1> if T350 expires or is stopped:
 - 2> release the *wlan-OffloadConfigDedicated* and *t350*;
 - 2> release *rclwi-Configuration* if configured;
 - 2> if the *wlan-OffloadConfigCommon* corresponding to the RPLMN is broadcast by the cell:
 - 3> apply the wlan-OffloadConfigCommon and the wlan-Id-List corresponding to the RPLMN included in SystemInformationBlockType17;

5.6.12.5 Cell selection/ re-selection while T350 is running

The UE shall:

- 1> if, while T350 is running, the UE selects/ reselects a cell which is not the PCell when the *wlan-OffloadDedicated* was configured:
 - 2> stop timer T350;
 - 2> perform the actions as specified in 5.6.12.4;

5.6.13 SCG failure information

5.6.13.1 General

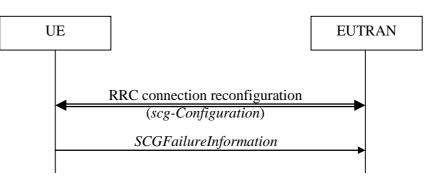


Figure 5.6.13.1-1: SCG failure information

The purpose of this procedure is to inform E-UTRAN about an SCG failure the UE has experienced i.e. SCG radio link failure, SCG change failure.

5.6.13.2 Initiation

A UE initiates the procedure to report SCG failures when SCG transmission is not suspended and when one of the following conditions is met:

- 1> upon detecting radio link failure for the SCG, in accordance with 5.3.11; or
- 1> upon SCG change failure, in accordance with 5.3.5.7a; or
- 1> upon stopping uplink transmission towards the PSCell due to exceeding the maximum uplink transmission timing difference when *powerControlMode* is configured to 1, in accordance with clause 7.17.2 of TS 36.133 [29].

In case of DC, upon initiating the procedure, the UE shall:

- 1> suspend all SCG DRBs and suspend SCG transmission for split DRBs;
- 1> reset SCG-MAC;

```
1> stop T307;
```

- 1> if the UE is configured with NE-DC:
 - 2> initiate transmission of the SCGFailureInformationEUTRA message via the NR MCG as specified in TS 38.331 [82], clause 5.7.3a;
- 1> else:

2> initiate transmission of the SCGFailureInformation message in accordance with 5.6.13.3;

5.6.13.3 Actions related to transmission of SCGFailureInformation message

The UE shall set the contents of the SCGFailureInformation message as follows:

1> if the UE initiates transmission of the *SCGFailureInformation* message to provide SCG radio link failure information:

2> include *failureType* and set it to the trigger for detecting SCG radio link failure;

1> else if the UE initiates transmission of the *SCGFailureInformation* message to provide SCG change failure information:

2> include failureType and set it to scg-ChangeFailure;

1> else if the UE initiates transmission of the *SCGFailureInformation* message due to exceeding maximum uplink transmission timing difference:

2> include *failureType* and set it to *maxUL-TimingDiff*;

- 1> set the *measResultServFreqList* to include for each E-UTRA SCG cell that is configured, if any, within *measResultSCell* the quantities of the concerned SCell, if available according to performance requirements in TS 36.133 [16];
- 1> for each E-UTRA SCG serving frequency included in *measResultServFreqList*, include within *measResultBestNeighCell* the *physCellId* and the quantities of the best non-serving cell, based on RSRP, on the concerned serving frequency;
- 1> set the *measResultNeighCells* to include the best measured cells on non-serving E-UTRA frequencies, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected the failure, and set its fields as follows;
 - 2> if the UE was configured to perform measurements for one or more non-serving EUTRA frequencies and measurement results are available, include the *measResultListEUTRA*;
 - 2> for each neighbour cell included, include the optional fields that are available;
- NOTE 1: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

The UE shall submit the SCGFailureInformation message to lower layers for transmission.

5.6.13.4 Failure type determination in NE-DC

The UE shall:

1> if SCG failure is due to T313 expiry:

2> consider the *failureType* to be *t313-Expiry*;

- 1> else if SCG failure is due to indication from SCG MAC that a random access problem was detected:
 - 2> consider the *failureType* to be *randomAccessProblem*;
- 1> else if SCG failure is due to indication from SCG RLC that the maximum number of retransmissions was reached:

2> consider the *failureType* to be *rlc-MaxNumRetx*;

1> else if SCG failure is due to SCG change failure:

2> consider the *failureType* to be *scg-ChangeFailure*;

5.6.13.5 Setting the contents of *MeasResultSCG-FailureMRDC*

The UE shall:

- 1> set the contents of the *MeasResultSCG-FailureMRDC* as follows:
 - 2> for each measObjectEUTRA for which a measId is configured and for which measurement results are available;
 - 3> include an entry in *measResultsFreqListEUTRA*;
 - 3> if a serving cell is associated with the *MeasObjectEUTRA*:
 - 4> set measResultServingCell to include the available quantities of the concerned cell and in accordance with the performance requirements in TS 36.133 [16];

- 3> set the measResultNeighCellList to include the best measured cells, ordered such that the best cell is listed first, and based on measurements collected up to the moment the UE detected the failure, and set its fields as follows;
 - 4> ordering the cells with sorting as follows:
 - 5> using RSRP if RSRP measurement results are available, otherwise using RSRQ if RSRQ measurement results are available, otherwise using SINR;
 - 4> for each neighbour cell included:
 - 5> include the optional fields for which measurement results are available;
- NOTE: The measured quantities are filtered by the L3 filter as configured in the mobility measurement configuration. The measurements are based on the time domain measurement resource restriction, if configured. Blacklisted cells are not required to be reported.

5.6.13a NR SCG failure information

5.6.13a.1 General

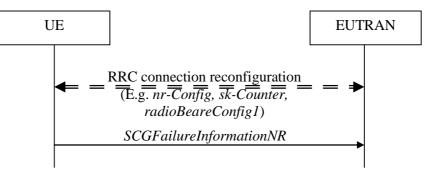


Figure 5.6.13a.1-1: NRSCG failure information

The purpose of this procedure is to inform E-UTRAN about an SCG failure the UE has experienced (e.g. SCG radio link failure, failure to successfully complete an SCG reconfiguration with sync), as specified in TS 38.331 [82], clause 5.7.3.2.

5.6.13a.2 Initiation

A UE initiates the procedure to report NR SCG failures when NR SCG transmission is not suspended and in accordance with TS 38.331 [82], clause 5.7.3.2. Actions the UE shall perform upon initiating the procedure, other than related to the transmission of the *SCGFailureInformationNR* message are specified in TS 38.331 [82], clause 5.7.3.2.

5.6.13a.3 Actions related to transmission of SCGFailureInformationNR message

The UE shall set the contents of the SCGFailureInformationNR message as follows:

- 1> include *failureType* within *failureReportSCG-NR* and set it to indicate the SCG failure in accordance with TS 38.331 [82], clause 5.7.3.3;
- 1> include and set *measResultSCG* in accordance with TS 38.331 [82], clause 5.7.3.4:
- 1> for each NR frequency the UE is configured to measure by *measConfig* for which measurement results are available:
 - 2> set the *measResultFreqListNR* to include the best measured cells, ordered such that the best cell is listed first using RSRP to order if RSRP measurement results are available for cells on this frequency, otherwise using RSRQ to order if RSRQ measurement results are available for cells on this frequency, otherwise using SINR to order, and based on measurements collected up to the moment the UE detected the failure, and for each cell that is included, include the optional fields that are available;

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NOTE: Field *measResultSCG* is used to report available results for NR frequencies the UE is configured to measure by NR RRC signalling.

The UE shall submit the SCGFailureInformationNR message to lower layers for transmission.

5.6.14 LTE-WLAN Aggregation

5.6.14.1 Introduction

E-UTRAN can configure the UE to connect to a WLAN and configure bearers for LWA (referred to as LWA DRBs). The UE uses the WLAN parameters received from E-UTRAN in performing WLAN measurements. The UE also performs WLAN connection management as described in 5.6.15 while LWA is configured.

5.6.14.2 Reception of LWA configuration

Upon reception of LWA configuration, the UE shall:

- 1> if the received *lwa-Configuration* is set to *release*:
 - 2> release the LWA configuration as described in 5.6.14.3;

1> else:

- 2> if the received *lwa-Config* includes *lwa-WT-Counter*:
 - 3> determine the S-K_{WT} key based on the K_{eNB} key and received *lwa-WT-Counter* value, as specified in TS 33.401 [32];
 - 3> forward the S-K_{WT} key to upper layers to be used as a PMK or PSK for WLAN authentication;
- 2> if the received *lwa-Config* includes *lwa-MobilityConfig*:
 - 3> if the received *lwa-MobilityConfig* includes *wlan-ToReleaseList*:
 - 4> for each WLAN-Identifiers included in wlan-ToReleaseList:
 - 5> remove the WLAN-Identifiers if already part of the current *wlan-MobilitySet* in *VarWLAN-MobilityConfig*;
 - 3> if the received *lwa-MobilityConfig* includes *wlan-ToAddList*:
 - 4> for each WLAN-Identifiers included in wlan-ToAddList:
 - 5> add the WLAN-Identifiers to the current wlan-MobilitySet in VarWLAN-MobilityConfig;
 - 3> if the received *lwa-MobilityConfig* includes *associationTimer*:

4> start or restart timer T351 with the timer value set to the associationTimer;

- 3> if the received *lwa-MobilityConfig* includes *successReportRequested*:
 - 4> set successReportRequested in VarWLAN-MobilityConfig to the value of successReportRequested;
- 3> if the received *lwa-MobilityConfig* includes *wlan-SuspendConfig*:
 - 4> set the field(s) in wlan-SuspendConfig within VarWLAN-MobilityConfig to the value(s) of field(s) included in wlan-SuspendConfig;
- 2> start WLAN Status Monitoring as described in 5.6.15.4;

5.6.14.3 Release of LWA configuration

To release the LWA configuration, the UE shall:

1> for each LWA DRB that is part of the current UE configuration:

- 2> disable data handling for this DRB at the LWAAP entity;
- 2> perform PDCP data recovery as specified in TS 36.323 [8];
- 1> delete any existing values in VarWLAN-MobilityConfig and VarWLAN-Status;
- 1> stop timer T351, if running;
- 1> stop WLAN status monitoring and WLAN connection attempts for LWA;
- 1> indicate the release of LWA configuration, if configured, to upper layers;

5.6.15 WLAN connection management

5.6.15.1 Introduction

WLAN connection management procedures in this clause are triggered as specified in other clauses where the UE is using a WLAN connection for LWA, RCLWI or LWIP.

The UE stores the current WLAN mobility set, which is a set of one or more WLAN identifier(s) (e.g. BSSID, SSID, HESSID) in *wlan-MobilitySet* in *VarWLAN-MobilityConfig*. This WLAN mobility set can be configured and updated by the eNB. A WLAN is considered to be inside the WLAN mobility set if its identifiers match all WLAN identifiers of at least one entry in *wlan-MobilitySet* and outside the WLAN mobility set otherwise. When the UE receives a new or updated WLAN mobility set, it initiates connection to a WLAN inside the WLAN mobility set, if not already connected to such a WLAN, and starts WLAN status monitoring as described in 5.6.15.4. The UE can perform WLAN mobility within the WLAN mobility set (connect or reconnect to a WLAN inside the WLAN mobility set) without any signalling to E-UTRAN.

The UE reports the WLAN connection status information to E-UTRAN as described in 5.6.15.2. The information in this report is based on the monitoring of WLAN connection as described in 5.6.15.4.

5.6.15.2 WLAN connection status reporting

5.6.15.2.1 General



Figure 5.6.15.2.1-1: WLAN connection status reporting

The purpose of this procedure is to inform E-UTRAN about the status of WLAN connection for LWA, RCLWI, or LWIP.

5.6.15.2.2 Initiation

The UE in RRC_CONNECTED initiates the WLAN status reporting procedure when:

- 1> it connects successfully to a WLAN inside WLAN mobility set while T351 is running after a WLAN mobility set change; or
- 1> after a lwa-WT-Counter update or after a lwip-Counter update (if success report is requested by the eNB); or
- 1> its connection or connection attempts to all WLAN(s) inside WLAN mobility set fails in accordance with WLAN Status Monitoring described in 5.6.15.4; or
- 1> T351 expires; or

- 1> its WLAN connection to all WLAN(s) inside WLAN mobility set becomes temporarily unavailable; or
- 1> its WLAN connection to a WLAN inside the WLAN mobility set is successfully established after its previous WLAN Connection Status Report indicating WLAN temporary suspension;

Upon initiating the procedure, the UE shall:

1> initiate transmission of the WLANConnectionStatusReport message in accordance with 5.6.15.2.3;

5.6.15.2.3 Actions related to transmission of *WLANConnectionStatusReport* message

The UE shall set the contents of the WLANConnectionStatusReport message as follows:

- 1> set *wlan-status* to *status* in *VarWLAN-Status*;
- 1> submit the *WLANConnectionStatusReport* message to lower layers for transmission, upon which the procedure ends;

5.6.15.3 T351 Expiry (WLAN connection attempt timeout)

Upon T351 expiry, the UE shall:

- 1> set the *status* in *VarWLAN-Status* to *failureTimeout*;
- 1> perform WLAN connection status reporting procedure in 5.6.15.2;
- 1> stop WLAN status monitoring and WLAN connection attempts;

5.6.15.4 WLAN status monitoring

To perform WLAN status monitoring, the UE shall:

- 1> if UE is not configured with *rclwi-Configuration* and WLAN connection to a WLAN inside the WLAN mobility set is successfully established or maintained after a WLAN mobility set configuration update, after a *lwa-WT-Counter* update or after a *lwip-Counter* update:
 - 2> set the *status* in *VarWLAN-Status* to *successfulAssociation*;
 - 2> stop timer T351, if running;
 - 2> if successReportRequested in VarWLAN-MobilityConfig is set to TRUE:

3> perform WLAN Connection Status Reporting procedure in 5.6.15.2;

- 1> if WLAN connection or connection attempts to all WLAN(s) inside WLAN mobility set fails:
 - 2> if the failure is due to WLAN radio link issues:

3> set the *status* in *VarWLAN-Status* to *failureWlanRadioLink*;

2> else if the failure is due to UE internal problems related to WLAN:

- 3> set the *status* in *VarWLAN-Status* to *failureWlanUnavailable*;
- NOTE 1: The UE internal problems related to WLAN include connection to another WLAN based on user preferences or turning off WLAN connection or connection rejection from WLAN or other WLAN problems.
 - 3> remove all WLAN related measurement reporting entries within VarMeasReportList;
 - 2> stop timer T351, if running;
 - 2> perform WLAN Connection Status Reporting procedure in 5.6.15.2;
 - 2> if the UE is configured with *rclwi-Configuration*:

- 3> release *rclwi-Configuration* and inform upper layers of a move-traffic-from-WLAN indication (see TS 24.302 [74]);
- 2> stop WLAN Status Monitoring and WLAN connection attempts;
- 1> if wlan-SuspendResumeAllowed in wlan-SuspendConfig within VarWLAN-MobilityConfig is set to TRUE:
 - 2> if WLAN connection to all WLAN(s) inside WLAN mobility set becomes temporarily unavailable:
 - 3> set the *status* in *VarWLAN-Status* to *suspended*;
 - 3> if *wlan-SuspendTriggersStatusReport* in *wlan-SuspendConfig* within *VarWLAN-MobilityConfig* is set to *TRUE*:
 - 4> trigger PDCP Status Report as specified in TS 36.323 [8];
 - 3> perform WLAN Connection Status Reporting procedure in 5.6.15.2;
 - 2> if the status in VarWLAN-Status in the last WLAN Connection Status Report by this UE was suspended and WLAN connection to a WLAN inside the WLAN mobility set is successfully established:
 - 3> set the status in VarWLAN-Status to resumed;
 - 3> perform WLAN Connection Status Reporting procedure in 5.6.15.2;

5.6.16 RAN controlled LTE-WLAN interworking

5.6.16.1 General

The purpose of this procedure is to perform RAN-controlled LTE-WLAN interworking (RCLWI) i.e. control access network selection and traffic steering between E-UTRAN and WLAN.

5.6.16.2 WLAN traffic steering command

The UE shall:

- 1> if the received *rclwi-Configuration* is set to *setup*:
 - 2> if the *command* is set to *steerToWLAN*:
 - 3> inform the upper layers of a move-traffic-to-WLAN indication along with the WLAN identifier lists in steerToWLAN (see TS 24.302 [74]);
 - 3> store steerToWLAN in wlan-MobilitySet in VarWLAN-MobilityConfig;
 - 3> perform the WLAN status monitoring procedure as specified in 5.6.15.4 using steerToWLAN as the WLAN mobility set;

- 3> inform the upper layers of a move-traffic-from-WLAN indication (see TS 24.302 [74]);
- 3> clear *wlan-MobilitySet* in *VarWLAN-MobilityConfig*;
- 3> stop performing the WLAN status monitoring procedure as specified in 5.6.15.4;
- 3> delete any existing values in VarWLAN-Status;
- 1> else (the *rclwi-Configuration* is released):
 - 2> clear *wlan-MobilitySet* in *VarWLAN-MobilityConfig*;
 - 2> stop performing the WLAN status monitoring procedure as specified in 5.6.15.4;
 - 2> delete any existing values in VarWLAN-Status;

2> inform the upper layers of release of the *rclwi-Configuration*.

5.6.17 LTE-WLAN aggregation with IPsec tunnel

5.6.17.1 General

The WLAN resources that are used over the LWIP tunnel as described in TS 36.300 [9] established as part of LWIP procedures are referred to as 'LWIP resources'. The purpose of this clause is to specify procedures to indicate to higher layers to initiate the establishment/ release of the LWIP tunnel over WLAN and to indicate which DRB(s) shall use the LWIP resources.

5.6.17.2 LWIP reconfiguration

The UE shall:

- 1> if the received *lwip-Configuration* is set to *release*:
 - 2> release the LWIP configuration, if configured, as described in 5.6.17.3;

1> else:

- 2> if *lwip-MobilityConfig* is included:
 - 3> if the received *lwip-MobilityConfig* includes *wlan-ToReleaseList*:
 - 4> for each WLAN-Identifiers included in wlan-ToReleaseList:
 - 5> remove the WLAN-Identifiers if already part of the current wlan-MobilitySet in VarWLAN-MobilityConfig;
 - 3> if the received *lwip-MobilityConfig* includes *wlan-ToAddList*:
 - 4> for each WLAN-Identifiers included in wlan-ToAddList:

5> add the WLAN-Identifiers to the current wlan-MobilitySet in VarWLAN-MobilityConfig;

3> if the received *lwip-MobilityConfig* includes *associationTimer*:

4> start timer T351 with the timer value set according to the value of associationTimer;

3> if the received *lwip-MobilityConfig* includes *successReportRequested*:

4> set successReportRequested in VarWLAN-MobilityConfig to the value of successReportRequested;

- 2> if *tunnelConfigLWIP* is included:
 - 3> indicate to higher layers to configure the LWIP tunnel according to the received *tunnelConfigLWIP*, as specified in TS 33.401 [32];
 - 3> if *lwip-Counter* is included:
 - 4> determine the LWIP-PSK based on the K_{eNB} key and received *lwip-Counter* value, as specified in TS 33.401 [32];
 - 4> forward the LWIP-PSK to upper layers for LWIP tunnel establishment;

2> start WLAN Status Monitoring as described in 5.6.15.4;

5.6.17.3 LWIP release

The UE shall:

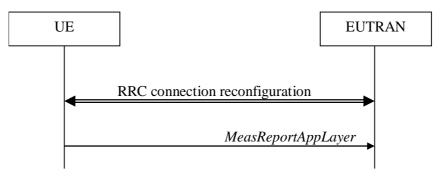
- 1> delete any existing values in VarWLAN-MobilityConfig and VarWLAN-Status;
- 1> stop timer T351, if running;

- 1> release the *lwip-Configuration*;
- 1> indicate to higher layers to stop all DRBs from using the LWIP resources;
- 1> indicate to higher layers to release the LWIP tunnel, as specified in TS 33.401 [32];
- 1> stop WLAN status monitoring and WLAN connection attempts for LWIP;

5.6.18 Void

5.6.19 Application layer measurement reporting

5.6.19.1 General





The purpose of this procedure is to inform E-UTRAN about application layer measurement report.

5.6.19.2 Initiation

A UE capable of application layer measurement reporting in RRC_CONNECTED may initiate the procedure when configured with application layer measurement, i.e. when *measConfigAppLayer* has been configured by E-UTRAN.

Upon initiating the procedure, the UE shall:

- 1> if configured with application layer measurement, and SRB4 is configured, and the UE has received application layer measurement report information from upper layers:
 - 2> set the measReportAppLayerContainer in the MeasReportAppLayer message to the value of the application layer measurement report information;
 - 2> submit the MeasReportAppLayer message to lower layers for transmission via SRB4.

5.6.20 IDLE Mode Measurements

5.6.20.1 General

This procedure specifies the measurements done by a UE in RRC_IDLE or RRC_INACTIVE when it has an IDLE mode measurement configuration and the storage of the available measurements by a UE in RRC_IDLE, RRC_INACTIVE and RRC_CONNECTED.

5.6.20.2 Initiation

While T331 is running, the UE shall:

- 1> perform the measurements in accordance with the following:
 - 2> for each entry in *measIdleCarrierListEUTRA* within *VarMeasIdleConfig*:

- 3> if UE supports carrier aggregation between serving carrier and the carrier frequency and bandwidth indicated by *carrierFreq* and *allowedMeasBandwidth* within the corresponding entry;
 - 4> perform measurements in the carrier frequency and bandwidth indicated by *carrierFreq* and *allowedMeasBandwidth* within the corresponding entry;
- NOTE: The fields *s*-*NonIntraSearch* in *SystemInformationBlockType3* do not affect the UE measurement procedures in IDLE mode. How the UE performs measurements in IDLE mode is up to UE implementation as long as the requirements in TS 36.133 [16] are met for measurement reporting. UE is not required to perform idle measurements if the SIB2 does not contain *idleModeMeasurements*.
 - 4> if the *measCellList* is included:
 - 5> consider the serving cell and cells identified by each entry within the *measCellList* to be applicable for idle mode measurement reporting;
 - 4> else:
 - 5> consider the serving cell and up to *maxCellMeasIdle* strongest identified cells whose RSRP/RSRQ measurement results are above the value(s) provided in *qualityThreshold* (if any) to be applicable for idle mode measurement reporting;
 - 4> store measurement results for cells applicable for idle mode measurement reporting within the VarMeasIdleReport;

- 4> do not consider the carrier frequency to be applicable for idle mode measurement reporting;
- 1> if *validityArea* is configured in *VarMeasIdleConfig* and UE reselects to a serving cell whose physical cell identity does not match any entry in *validityArea* for the corresponding carrier frequency:

2> stop T331;

5.6.20.3 T331 expiry or stop

The UE shall:

- 1> if T331 expires or is stopped:
 - 2> release the *VarMeasIdleConfig*;
- NOTE: It is up to UE implementation whether to continue IDLE mode measurements according to SIB5 configuration after T331 has expired or stopped.

5.6.21 Failure information

5.6.21.1 General



Figure 5.6.21.1-1: Failure information

The purpose of this procedure is to inform E-UTRAN about a failure that the UE has experienced.

5.6.21.2 Initiation

A UE initiates the procedure to report failures when one of the following conditions is met:

1> upon detecting RLC failure, in accordance with 5.3.11.

Upon initiating the procedure, the UE shall:

1> initiate transmission of the FailureInformation message in accordance with 5.6.21.3;

5.6.21.3 Actions related to transmission of *FailureInformation* message

When initiating the procedure according to 5.6.21.2, the UE shall set the contents of the *FailureInformation* message as follows:

1> if the procedure is initiated to report RLC failure:

2> set *logicalChannelIdentity* to the logical channel identity of the RLC entity;

2> set *cellGroupIndication* to the cell group where the RLC entity is located;

2> set *failureType* to the type of failure that has been detected;

The UE shall submit the FailureInformation message to lower layers for transmission.

5.7 Generic error handling

5.7.1 General

The generic error handling defined in the subsequent sub-clauses applies unless explicitly specified otherwise e.g. within the procedure specific error handling.

The UE shall consider a value as not comprehended when it is set:

- to an extended value that is not defined in the version of the transfer syntax supported by the UE.
- to a spare or reserved value unless the specification defines specific behaviour that the UE shall apply upon receiving the concerned spare/ reserved value.

The UE shall consider a field as not comprehended when it is defined:

- as spare or reserved unless the specification defines specific behaviour that the UE shall apply upon receiving the concerned spare/ reserved field.

5.7.2 ASN.1 violation or encoding error

The UE shall:

- 1> when receiving an RRC message on the BCCH, BR-BCCH, PCCH, CCCH, MCCH, SC-MCCH or SBCCH for which the abstract syntax is invalid, as specified in ITU-T X.680 (07/2002) [13]:
 - 2> ignore the message;
- NOTE: This clause applies in case one or more fields is set to a value, other than a spare, reserved or extended value, not defined in this version of the transfer syntax. E.g. in the case the UE receives value 12 for a field defined as INTEGER (1..11). In cases like this, it may not be possible to reliably detect which field is in the error hence the error handling is at the message level.

5.7.3 Field set to a not comprehended value

The UE shall, when receiving an RRC message on any logical channel:

1> if the message includes a field that has a value that the UE does not comprehend:

2> if a default value is defined for this field:

3> treat the message while using the default value defined for this field;

- 2> else if the concerned field is optional:
 - 3> treat the message as if the field were absent and in accordance with the need code for absence of the concerned field;

2> else:

3> treat the message as if the field were absent and in accordance with sub-clause 5.7.4;

5.7.4 Mandatory field missing

The UE shall:

- 1> if the message includes a field that is mandatory to include in the message (e.g. because conditions for mandatory presence are fulfilled) and that field is absent or treated as absent:
 - 2> if the RRC message was received on DCCH or CCCH:

3> ignore the message;

2> else:

}

- 3> if the field concerns a (sub-field of) an entry of a list (i.e. a SEQUENCE OF):
 - 4> treat the list as if the entry including the missing or not comprehended field was not present;
- 3> else if the field concerns a sub-field of another field, referred to as the 'parent' field i.e. the field that is one nesting level up compared to the erroneous field:
 - 4> consider the 'parent' field to be set to a not comprehended value;
 - 4> apply the generic error handling to the subsequent 'parent' field(s), until reaching the top nesting level i.e. the message level;
- 3> else (field at message level):
 - 4> ignore the message;
- NOTE 1: The error handling defined in these sub-clauses implies that the UE ignores a message with the message type or version set to a not comprehended value.
- NOTE 2: The nested error handling for messages received on logical channels other than DCCH and CCCH applies for errors in extensions also, even for errors that can be regarded as invalid E-UTRAN operation e.g. E-UTRAN not observing conditional presence.

The following ASN.1 further clarifies the levels applicable in case of nested error handling for errors in extension fields.

```
-- /example/ ASN1START
-- Example with extension addition group
ItemInfoList ::=
                                    SEQUENCE (SIZE (1..max)) OF ItemInfo
ItemInfo ::=
                                     SEQUENCE {
                                         INTEGER (1..max),
    itemIdentity
    field1
                                         Field1,
    field2
                                        Field2
                                                                 OPTIONAL.
                                                                                      -- Need ON
      field3-r9
                                         Field3-r9
                                                                 OPTIONAL,
                                                                                      -- Cond Cond1
        field4-r9
                                         Field4-r9
                                                                 OPTIONAL
                                                                                      -- Need ON
    11
```

```
-- Example with traditional non-critical extension (empty sequence)
BroadcastInfoBlock1 ::=
                                 SEQUENCE {
   itemIdentity
                                       INTEGER (1..max),
   field1
                                      Field1,
   field2
                                       Field2
                                                              OPTIONAL.
                                                                                  -- Need ON
   nonCriticalExtension
                                       BroadcastInfoBlock1-v940-IEs OPTIONAL
}
BroadcastInfoBlock1-v940-IEs::= SEQUENCE {
                                       Field3-r9
                                                              OPTIONAL,
   field3-r9
                                                                                  -- Cond Cond1
                                                              OPTIONAL,
   field4-r9
                                       Field4-r9
                                                                                  -- Need ON
   nonCriticalExtension
                                       SEQUENCE { }
                                                                                  -- Need OP
                                                              OPTIONAL
}
-- ASN1STOP
```

The UE shall, apply the following principles regarding the levels applicable in case of nested error handling:

- an extension additon group is not regarded as a level on its own. E.g. in the ASN.1 extract in the previous, a error regarding the conditionality of *field3* would result in the entire itemInfo entry to be ignored (rather than just the extension addition group containing *field3* and *field4*)
- a traditional *nonCriticalExtension* is not regarded as a level on its own. E.g. in the ASN.1 extract in the previous, a error regarding the conditionality of *field3* would result in the entire *BroadcastInfoBlock1* to be ignored (rather than just the non critical extension containing *field3* and *field4*).

5.7.5 Not comprehended field

The UE shall, when receiving an RRC message on any logical channel:

- 1> if the message includes a field that the UE does not comprehend:
 - 2> treat the rest of the message as if the field was absent;
- NOTE: This clause does not apply to the case of an extension to the value range of a field. Such cases are addressed instead by the requirements in clause 5.7.3.

5.8 MBMS

5.8.1 Introduction

5.8.1.1 General

In general the control information relevant only for UEs supporting MBMS is separated as much as possible from unicast control information. Most of the MBMS control information is provided on a logical channel specific for MBMS common control information: the MCCH. E-UTRA employs one MCCH logical channel per MBSFN area. In case the network configures multiple MBSFN areas, the UE acquires the MBMS control information from the MCCHs that are configured to identify if services it is interested to receive are ongoing. The action applicable when the UE is unable to simultaneously receive MBMS and unicast services is up to UE implementation. In this release of the specification, an MBMS capable UE is only required to support reception of a single MBMS service at a time, and reception of more than one MBMS service (also possibly on more than one MBSFN area) in parallel is left for UE implementation. The MCCH carries the *MBSFNAreaConfiguration* message, which indicates the MBMS sessions that are ongoing as well as the (corresponding) radio resource configuration. The MCCH may also carry the *MBMSCountingRequest* message, when E-UTRAN wishes to count the number of UEs in RRC_CONNECTED that are receiving or interested to receive one or more specific MBMS services.

A limited amount of MBMS control information is provided on the BCCH. This primarily concerns the information needed to acquire the MCCH(s). This information is carried by means of a single MBMS specific *SystemInformationBlock: SystemInformationBlockType13*. An MBSFN area is identified solely by the *mbsfn-AreaId* in *SystemInformationBlockType13*. At mobility, the UE considers that the MBSFN area is continuous when the source cell and the target cell broadcast the same value in the *mbsfn-AreaId*.

5.8.1.2 Scheduling

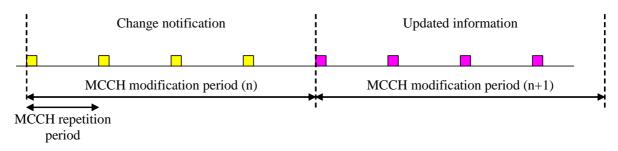
The MCCH information is transmitted periodically, using a configurable repetition period. Scheduling information is not provided for MCCH i.e. both the time domain scheduling as well as the lower layer configuration are semi-statically configured, as defined within *SystemInformationBlockType13*.

For MBMS user data, which is carried by the MTCH logical channel, E-UTRAN periodically provides MCH scheduling information (MSI) at lower layers (MAC). This MCH information only concerns the time domain scheduling i.e. the frequency domain scheduling and the lower layer configuration are semi-statically configured. The periodicity of the MSI is configurable and defined by the MCH scheduling period.

5.8.1.3 MCCH information validity and notification of changes

Change of MCCH information only occurs at specific radio frames, i.e. the concept of a modification period is used. Within a modification period, the same MCCH information may be transmitted a number of times, as defined by its scheduling (which is based on a repetition period). The modification period boundaries are defined by SFN values for which SFN mod m=0, where m is the number of radio frames comprising the modification period. The modification period is configured by means of *SystemInformationBlockType13*.

When the network changes (some of) the MCCH information, it notifies the UEs about the change during a first modification period. In the next modification period, the network transmits the updated MCCH information. These general principles are illustrated in figure 5.8.1.3-1, in which different colours indicate different MCCH information. Upon receiving a change notification, a UE interested to receive MBMS services acquires the new MCCH information immediately from the start of the next modification period. The UE applies the previously acquired MCCH information until the UE acquires the new MCCH information.





Indication of an MBMS specific RNTI, the M-RNTI (see TS 36.321 [6]), on PDCCH is used to inform UEs in RRC_IDLE and UEs in RRC_CONNECTED about an MCCH information change. When receiving an MCCH information change notification, the UE knows that the MCCH information will change at the next modification period boundary. The notification on PDCCH indicates which of the MCCHs will change, which is done by means of an 8-bit bitmap. Within this bitmap, the bit at the position indicated by the field *notificationIndicator* is used to indicate changes for that MBSFN area: if the bit is set to "1", the corresponding MCCH will change. No further details are provided e.g. regarding which MCCH information will change. The MCCH information change notification is used to inform the UE about a change of MCCH information upon session start or about the start of MBMS counting.

The MCCH information change notifications on PDCCH are transmitted periodically and are carried on MBSFN subframes only except on MBMS-dedicated cell or FeMBMS/Unicast-mixed cell where the MCCH information change is provided on non-MBSFN subframes. These MCCH information change notification occasions are common for all MCCHs that are configured, and configurable by parameters included in *SystemInformationBlockType13*: a repetition coefficient, a radio frame offset and a subframe index. These common notification occasions are based on the MCCH with the shortest modification period.

NOTE 1: E-UTRAN may modify the MBMS configuration information provided on MCCH at the same time as updating the MBMS configuration information carried on BCCH i.e. at a coinciding BCCH and MCCH modification period. Upon detecting that a new MCCH is configured on BCCH, a UE interested to receive one or more MBMS services should acquire the MCCH, unless it knows that the services it is interested in are not provided by the corresponding MBSFN area.

A UE that is receiving an MBMS service via MRB shall acquire the MCCH information from the start of each modification period. A UE interested to receive MBMS from a carrier on which *dl-Bandwidth* included in *MasterInformationBlock* is set to *n6* shall acquire the MCCH information at least once every MCCH modification

period. A UE that is not receiving an MBMS service via MRB, as well as UEs that are receiving an MBMS service via MRB but potentially interested to receive other services not started yet in another MBSFN area from a carrier on which *dl-Bandwidth* included in *MasterInformationBlock* is other than n6, shall verify that the stored MCCH information remains valid by attempting to find the MCCH information change notification at least *notificationRepetitionCoeff* times during the modification period of the applicable MCCH(s), if no MCCH information change notification is received.

NOTE 2: In case the UE is aware which MCCH(s) E-UTRAN uses for the service(s) it is interested to receive, the UE may only need to monitor change notifications for a subset of the MCCHs that are configured, referred to as the 'applicable MCCH(s)' in the above.

5.8.2 MCCH information acquisition

5.8.2.1 General

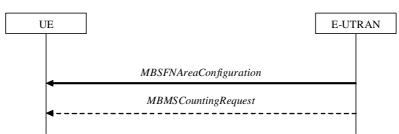


Figure 5.8.2.1-1: MCCH information acquisition

The UE applies the MCCH information acquisition procedure to acquire the MBMS control information that is broadcasted by the E-UTRAN. The procedure applies to MBMS capable UEs that are in RRC_IDLE or in RRC_CONNECTED.

5.8.2.2 Initiation

A UE interested to receive MBMS services shall apply the MCCH information acquisition procedure upon entering the corresponding MBSFN area (e.g. upon power on, following UE mobility) and upon receiving a notification that the MCCH information has changed. A UE that is receiving an MBMS service shall apply the MCCH information acquisition procedure to acquire the MCCH, that corresponds with the service that is being received, at the start of each modification period.

Unless explicitly stated otherwise in the procedural specification, the MCCH information acquisition procedure overwrites any stored MCCH information, i.e. delta configuration is not applicable for MCCH information and the UE discontinues using a field if it is absent in MCCH information unless explicitly specified otherwise.

5.8.2.3 MCCH information acquisition by the UE

An MBMS capable UE shall:

- 1> if the procedure is triggered by an MCCH information change notification:
 - 2> start acquiring the MBSFNAreaConfiguration message and the MBMSCountingRequest message if present, from the beginning of the modification period following the one in which the change notification was received;
- NOTE 1: The UE continues using the previously received MCCH information until the new MCCH information has been acquired.
- 1> if the UE enters an MBSFN area:
 - 2> acquire the MBSFNAreaConfiguration message and the MBMSCountingRequest message if present, at the next repetition period;
- 1> if the UE is receiving an MBMS service:

2> start acquiring the MBSFNAreaConfiguration message and the MBMSCountingRequest message if present, that both concern the MBSFN area of the service that is being received, from the beginning of each modification period;

5.8.2.4 Actions upon reception of the *MBSFNAreaConfiguration* message

No UE requirements related to the contents of this *MBSFNAreaConfiguration* apply other than those specified elsewhere e.g. within procedures using the concerned system information, the corresponding field descriptions.

5.8.2.5 Actions upon reception of the MBMSCountingRequest message

Upon receiving *MBMSCountingRequest* message, the UE shall perform the MBMS Counting procedure as specified in 5.8.4.

5.8.3 MBMS PTM radio bearer configuration

5.8.3.1 General

The MBMS PTM radio bearer configuration procedure is used by the UE to configure RLC, MAC and the physical layer upon starting and/or stopping to receive an MRB. The procedure applies to UEs interested to receive one or more MBMS services.

NOTE: In case the UE is unable to receive an MBMS service due to capability limitations, upper layers may take appropriate action e.g. terminate a lower priority unicast service.

5.8.3.2 Initiation

The UE applies the MRB establishment procedure to start receiving a session of a service it has an interest in. The procedure may be initiated e.g. upon start of the MBMS session, upon (re-)entry of the corresponding MBSFN service area, upon becoming interested in the MBMS service, upon removal of UE capability limitations inhibiting reception of the concerned service.

The UE applies the MRB release procedure to stop receiving a session. The procedure may be initiated e.g. upon stop of the MBMS session, upon leaving the corresponding MBSFN service area, upon losing interest in the MBMS service, when capability limitations start inhibiting reception of the concerned service.

5.8.3.3 MRB establishment

Upon MRB establishment, the UE shall:

- 1> establish an RLC entity in accordance with the configuration specified in 9.1.1.4;
- 1> configure an MTCH logical channel in accordance with the received *locgicalChannelIdentity*, applicable for the MRB, as included in the *MBSFNAreaConfiguration* message;
- 1> configure the physical layer in accordance with the *pmch-Config*, applicable for the MRB, as included in the *MBSFNAreaConfiguration* message;
- 1> inform upper layers about the establishment of the MRB by indicating the corresponding *tmgi* and *sessionId*;

5.8.3.4 MRB release

Upon MRB release, the UE shall:

- 1> release the RLC entity as well as the related MAC and physical layer configuration;
- 1> inform upper layers about the release of the MRB by indicating the corresponding *tmgi* and *sessionId*;

5.8.4 MBMS Counting Procedure

5.8.4.1 General

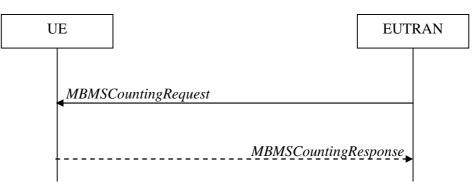


Figure 5.8.4.1-1: MBMS Counting procedure

The MBMS Counting procedure is used by the E-UTRAN to count the number of RRC_CONNECTED mode UEs which are receiving via an MRB or interested to receive via an MRB the specified MBMS services.

The UE determines interest in an MBMS service, that is identified by the TMGI, by interaction with upper layers.

5.8.4.2 Initiation

E-UTRAN initiates the procedure by sending an MBMSCountingRequest message.

5.8.4.3 Reception of the MBMSCountingRequest message by the UE

Upon receiving the *MBMSCountingRequest* message, the UE in RRC_CONNECTED mode shall:

- 1> if the SystemInformationBlockType1, that provided the scheduling information for the systemInformationBlockType13 that included the configuration of the MCCH via which the MBMSCountingRequest message was received, contained the identity of the Registered PLMN; and
- 1> if the UE is receiving via an MRB or interested to receive via an MRB at least one of the services in the received *countingRequestList:*
 - 2> if more than one entry is included in the *mbsfn-AreaInfoList* received in the *SystemInformationBlockType13* that included the configuration of the MCCH via which the *MBMSCountingRequest* message was received:
 - 3> include the *mbsfn-AreaIndex* in the *MBMSCountingResponse* message and set it to the index of the entry in the *mbsfn-AreaInfoList* within the received *SystemInformationBlockType13* that corresponds with the MBSFN area used to transfer the received *MBMSCountingRequest* message;
 - 2> for each MBMS service included in the received *countingRequestList*:
 - 3> if the UE is receiving via an MRB or interested to receive via an MRB this MBMS service:
 - 4> include an entry in the *countingResponseList* within the *MBMSCountingResponse* message with *countingResponseService* set it to the index of the entry in the *countingRequestList* within the received *MBMSCountingRequest* that corresponds with the MBMS service the UE is receiving or interested to receive;
 - 2> submit the MBMSCountingResponse message to lower layers for transmission upon which the procedure ends;
- NOTE 1: UEs that are receiving an MBMS User Service, as specified in TS 23.246 [56], by means of a Unicast Bearer Service, as specified in TS 26.346 [57], (i.e. via a DRB), but are interested to receive the concerned MBMS User Service, as specified in TS 23.246 [56], via an MBMS Bearer Service (i.e. via an MRB), respond to the counting request.

- NOTE 2: If ciphering is used at upper layers, the UE does not respond to the counting request if it can not decipher the MBMS service for which counting is performed (see TS 22.146 [62], clause 5.3).
- NOTE 3: The UE treats the *MBMSCountingRequest* messages received in each modification period independently. In the unlikely case E-UTRAN would repeat an *MBMSCountingRequest* (i.e. including the same services) in a subsequent modification period, the UE responds again. The UE provides at most one *MBMSCountingResponse* message to multiple transmission attempts of an *MBMSCountingRequest* messages in a given modification period.

5.8.5 MBMS interest indication

5.8.5.1 General

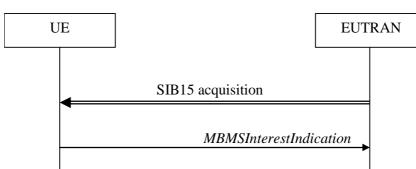


Figure 5.8.5.1-1: MBMS interest indication

The purpose of this procedure is to inform E-UTRAN that the UE is receiving or is interested to receive MBMS service(s) via an MRB or SC-MRB, and if so, to inform E-UTRAN about the priority of MBMS versus unicast reception or MBMS service(s) reception in receive only mode.

5.8.5.2 Initiation

An MBMS or SC-PTM capable UE in RRC_CONNECTED may initiate the procedure in several cases including upon successful connection establishment, upon entering or leaving the service area, upon session start or stop, upon change of interest, upon change of priority between MBMS reception and unicast reception, upon change to a PCell broadcasting *SystemInformationBlockType15*, upon starting and stopping of MBMS service(s) in receive only mode, upon change of receive only mode frequency, bandwidth or subcarrier spacing of MBMS service(s) in receive only mode.

Upon initiating the procedure, the UE shall:

- 1> if SystemInformationBlockType15 is broadcast by the PCell; or
- 1> if *mbms-ROM-ServiceIndication* is received in *SystemInformationBlockType2* from PCell:
 - 2> ensure having a valid version of SystemInformationBlockType15 for the PCell, if present;
 - 2> if the UE did not transmit an *MBMSInterestIndication* message since last entering RRC_CONNECTED state; or
 - 2> if since the last time the UE transmitted an MBMSInterestIndication message, the UE connected to a PCell neither broadcasting SystemInformationBlockType15 nor including mbms-ROM-ServiceIndication in SystemInformationBlockType2:
 - 3> if the set of MBMS frequencies of interest, determined in accordance with 5.8.5.3, is not empty:
 - 4> initiate transmission of the *MBMSInterestIndication* message in accordance with 5.8.5.4;

2> else:

3> if the set of MBMS frequencies of interest, determined in accordance with 5.8.5.3, has changed since the last transmission of the *MBMSInterestIndication* message; or

- 3> if at least one of the subcarrier spacing or bandwidth parameter of receive only mode MBMS frequency of interest, determined in accordance with 5.8.5.3, has changed since the last transmission of the *MBMSInterestIndication* message; or
- 3> if the prioritisation of reception of all indicated MBMS frequencies compared to reception of any of the established unicast bearers has changed since the last transmission of the *MBMSInterestIndication* message:
 - 4> initiate transmission of the *MBMSInterestIndication* message in accordance with 5.8.5.4;
- NOTE: The UE may send an *MBMSInterestIndication* even when it is able to receive the MBMS services it is interested in i.e. to avoid that the network allocates a configuration inhibiting MBMS reception.
 - 3> else if *SystemInformationBlockType20* is broadcast by the PCell:
 - 4> if since the last time the UE transmitted an MBMSInterestIndication message, the UE connected to a PCell not broadcasting SystemInformationBlockType20; or
 - 4> if the set of MBMS services of interest determined in accordance with 5.8.5.3a is different from *mbms-Services* included in the last transmission of the *MBMSInterestIndication* message;
 - 5> initiate the transmission of the *MBMSInterestIndication* message in accordance with 5.8.5.4.

5.8.5.3 Determine MBMS frequencies of interest

The UE shall:

- 1> consider a frequency to be part of the MBMS frequencies of interest if the following conditions are met:
 - 2> at least one MBMS session the UE is receiving or interested to receive via an MRB or SC-MRB is ongoing or about to start; and
- NOTE 1: The UE may determine whether the session is ongoing from the start and stop time indicated in the User Service Description (USD), see TS 36.300 [9] or TS 26.346 [57].
 - 2> for at least one of these MBMS sessions either *SystemInformationBlockType15* acquired from the PCell includes for the concerned frequency one or more MBMS SAIs as indicated in the USD for this session or this session is in receive only mode; and
- NOTE 2: The UE considers a frequency to be part of the MBMS frequencies of interest even though E-UTRAN may (temporarily) not employ an MRB or SC-MRB for the concerned session. I.e. the UE does not verify if the session is indicated on (SC-)MCCH
- NOTE 3: The UE considers the frequencies of interest independently of any synchronization state, e.g. TS 36.300 [9], Annex J.1.
 - 2> the UE is capable of simultaneously receiving MRBs and/or is capable of simultaneously receiving SC-MRBs on the set of MBMS frequencies of interest, regardless of whether a serving cell is configured on each of these frequencies or not; and
 - 2> the *supportedBandCombination* the UE included in *UE-EUTRA-Capability* contains at least one band combination including the set of MBMS frequencies of interest;
- NOTE 4: Indicating a frequency implies that the UE supports *SystemInformationBlockType13* or *SystemInformationBlockType20* acquisition for the concerned frequency i.e. the indication should be independent of whether a serving cell is configured on that frequency.
- NOTE 5: When evaluating which frequencies it can receive simultaneously, the UE does not take into account the serving frequencies that are currently configured i.e. it only considers MBMS frequencies it is interested to receive.

NOTE 6: The set of MBMS frequencies of interest includes at most one frequency for a given physical frequency. The UE only considers a physical frequency to be part of the MBMS frequencies of interest if it supports at least one of the bands indicated for this physical frequency in *SystemInformationBlockType1* (for serving frequency) or *SystemInformationBlockType15* (for neighbouring frequencies). In this case, E-UTRAN may assume the UE supports MBMS reception on any of the bands supported by the UE (i.e. according to *supportedBandCombination*).

5.8.5.3a Determine MBMS services of interest

The UE shall:

- 1> consider a MBMS service to be part of the MBMS services of interest if the following conditions are met:
 - 2> the UE is SC-PTM capable; and
 - 2> the UE is receiving or interested to receive this service via an SC-MRB; and
 - 2> one session of this service is ongoing or about to start; and
 - 2> one or more MBMS SAIs in the USD for this service is included in *SystemInformationBlockType15* acquired from the PCell for a frequency belonging to the set of MBMS frequencies of interest, determined according to 5.8.5.3.

5.8.5.4 Actions related to transmission of *MBMSInterestIndication* message

The UE shall set the contents of the MBMSInterestIndication message as follows:

- 1> if the set of MBMS frequencies of interest, determined in accordance with 5.8.5.3, is not empty:
 - 2> include mbms-FreqList and set it to include the MBMS frequencies of interest sorted by decreasing order of interest, using the EARFCN corresponding with freqBandIndicator included in SystemInformationBlockType1 (for serving frequency), if applicable, and the EARFCN(s) as included in SystemInformationBlockType15 (for neighbouring frequencies);
- NOTE 1: The EARFCN included in *mbms-FreqList* is merely used to indicate a physical frequency the UE is interested to receive i.e. the UE may not support the band corresponding to the included EARFCN (but it does support at least one of the bands indicated in system information for the concerned physical frequency).
 - 2> include *mbms-Priority* if the UE prioritises reception of all indicated MBMS frequencies above reception of any of the unicast bearers;
 - 2> if *SystemInformationBlockType20* is broadcast by the PCell:
 - 3> include *mbms-Services* and set it to indicate the set of MBMS services of interest determined in accordance with 5.8.5.3a;
- NOTE 2: If the UE prioritises MBMS reception and unicast data cannot be supported because of congestion on the MBMS carrier(s), E-UTRAN may initiate release of unicast bearers. It is up to E-UTRAN implementation whether all bearers or only GBR bearers are released. E-UTRAN does not initiate re-establishment of the released unicast bearers upon alleviation of the congestion.
- 1> if the UE is receiving MBMS service(s) in receive only mode:
 - 2> if the *supportedBandCombination* the UE included in *UE-EUTRA-Capability* contains at least one band combination including the *mbms-ROM-Freq*:
 - 3> include *mbms-ROM-Freq*, *mbms-ROM-SubcarrierSpacing* and *mbms-Bandwidth*;
- NOTE 3: The EARFCN included in *mbms-ROM-Freq* is used to indicate a physical frequency the UE is interested to receive MBMS service(s) in receive only mode and is determined based on UE implementation.

The UE shall submit the MBMSInterestIndication message to lower layers for transmission.

5.8a SC-PTM

5.8a.1 Introduction

5.8a.1.1 General

SC-PTM control information is provided on a specific logical channel: the SC-MCCH. The SC-MCCH carries the *SCPTMConfiguration* message which indicates the MBMS sessions that are ongoing as well as the (corresponding) information on when each session may be scheduled, i.e. scheduling period, scheduling window and start offset. The *SCPTMConfiguration* message also provides information about the neighbour cells transmitting the MBMS sessions which are ongoing on the current cell. In this release of the specification, an SC-PTM capable UE is only required to support reception of a single MBMS service at a time, and reception of more than one MBMS service in parallel is left for UE implementation.

A limited amount of SC-PTM control information is provided on the BCCH or BR-BCCH. This primarily concerns the information needed to acquire the SC-MCCH.

NOTE: For BL UEs and UEs in CE, SC-MCCH transmission uses a 1.4 MHz channel bandwidth and a maximum TBS of 936 bits, see TS 36.213 [23]. For NB-IoT UEs, the maximum TBS for SC-MCCH transmission is 680 bits, see TS 36.213 [23].

5.8a.1.2 SC-MCCH scheduling

The SC-MCCH information (i.e. information transmitted in messages sent over SC-MCCH) is transmitted periodically, using a configurable repetition period. SC-MCCH transmissions (and the associated radio resources and MCS) are indicated on PDCCH.

5.8a.1.3 SC-MCCH information validity and notification of changes

Change of SC-MCCH information only occurs at specific radio frames, i.e. the concept of a modification period is used. Within a modification period, the same SC-MCCH information may be transmitted a number of times, as defined by its scheduling (which is based on a repetition period). The modification period boundaries are defined by SFN values for which SFN mod m= 0, where m is the number of radio frames comprising the modification period. The modification period is configured by means of *SystemInformationBlockType20* (*SystemInformationBlockType20-NB* in NB-IoT). If H-SFN is provided in *SystemInformationBlockType1-BR*, modification period boundaries for BL UEs or UEs in CE are defined by SFN values for which (H-SFN * 1024 + SFN) mod m=0. The modification period boundaries for NB-IoT UEs are defined by SFN values for which (H-SFN * 1024 + SFN) mod m=0.

When the network changes (some of) the SC-MCCH information, it notifies the UEs, other than BL UEs, UEs in CE or NB-IoT UEs, about the change in the first subframe which can be used for SC-MCCH transmission in a repetition period. LSB bit in 8-bit bitmap when set to '1' indicates the change in SC-MCCH. Upon receiving a change notification, a UE interested to receive MBMS services transmitted using SC-PTM acquires the new SC-MCCH information starting from the same subframe. The UE applies the previously acquired SC-MCCH information until the UE acquires the new SC-MCCH information.

When the network changes (some of) the SC-MCCH information for start of new MBMS service(s) transmitted using SC-PTM, it notifies BL UEs, UEs in CE or NB-IoT UEs about the change in every PDCCH which schedules the first SC-MCCH in a repetition period in the current modification period. The notification is transmitted with 1 bit. The bit, when set to '1', indicates the start of new MBMS service(s), see TS 36.212 [22], clauses 5.3.3.1.14 and 6.4.3.3. Upon receiving a change notification, a BL UE, UE in CE or NB-IoT UE interested to receive MBMS services transmitted using SC-PTM acquires the new SC-MCCH information scheduled by the PDCCH. The BL UE, UE in CE or NB-IoT UE applies the previously acquired SC-MCCH information until the BL UE, UE in CE or NB-IoT UE acquires the new SC-MCCH information.

When the network changes SC-MTCH specific information e.g. start of new MBMS service(s) transmitted using SC-PTM or change of ongoing MBMS service(s) transmitted using SC-PTM, it notifies the BL UEs, UEs in CE or NB-IoT UEs in the PDCCH which schedules the SC-MTCH in the current modification period. The notification is transmitted with a 2 bit bitmap. The LSB in the 2-bit bitmap, when set to '1', indicates the change of the on-going MBMS service and the MSB in the 2-bit bitmap, when set to '1', indicates the start of new MBMS service(s), see TS 36.212 [22], clauses 5.3.3.1.12, 5.3.3.1.13 and 6.4.3.2. In the case the network changes an on-going SC-MTCH transmission in the next modification period, it notifies the BL UEs, UEs in CE or NB-IoT UEs in the PDCCH which schedules this SC-

MTCH in the current modification period. In the case the network starts new MBMS service(s) transmitted using SC-PTM, the network notifies the UEs which have on-going SC-MTCH in the PDCCH scheduling each of the SC-MTCH. Upon receiving such notification, a BL UE, UE in CE or NB-IoT UE acquires the new SC-MCCH information at the start of the next modification period. The BL UE, UE in CE or NB-IoT UE applies the previously acquired SC-MCCH information until the BL UE, UE in CE or NB-IoT UE acquires the new SC-MCCH information.

5.8a.1.4 Procedures

The SC-PTM capable UE receiving or interested to receive MBMS service(s) via SC-MRB applies SC-PTM procedures described in 5.8a and, except for NB-IoT UE, the MBMS interest indication procedure as specified in 5.8.5.

5.8a.2 SC-MCCH information acquisition

5.8a.2.1 General



Figure 5.8a.2.1-1: SC-MCCH information acquisition

The UE applies the SC-MCCH information acquisition procedure to acquire the SC-PTM control information that is broadcast by the E-UTRAN. The procedure applies to SC-PTM capable UEs that are in RRC_IDLE except for BL UEs, UEs in CE and NB-IoT UEs, performing EDT procedure. This procedure also applies to SC-PTM capable UEs that are in RRC_CONNECTED except for BL UEs, UEs in CE or NB-IoT UEs.

5.8a.2.2 Initiation

A UE interested to receive MBMS services via SC-MRB shall apply the SC-MCCH information acquisition procedure upon entering the cell broadcasting *SystemInformationBlockType20* (*SystemInformationBlockType20-NB* in NB-IoT) (e.g. upon power on, following UE mobility) and upon receiving a notification that the SC-MCCH information has changed. A UE, except for BL UE, UE in CE or NB-IoT UE, that is receiving an MBMS service via SC-MRB shall apply the SC-MCCH information acquisition procedure to acquire the SC-MCCH information that corresponds with the service that is being received, at the start of each modification period. The BL UE, UE in CE or NB-IoT UE that is receiving an MBMS service via SC-MRB shall apply the SC-MCCH information acquisition procedure upon receiving a notification that the SC-MCCH information procedure upon receiving a notification that the SC-MCCH information procedure upon receiving a notification that the SC-MCCH information procedure upon receiving a notification that the SC-MCCH information that corresponds with the service that is being received is about to be changed. The BL UE, UE in CE or NB-IoT UE that is receiving an MBMS service via SC-MRB may apply the SC-MCCH information acquisition procedure upon receiving a notification that the SC-MCCH information is about to be changed. The BL UE, UE in CE or NB-IoT UE that is receiving a notification that the SC-MCCH information is about to be changed due to start of a new service.

Unless explicitly stated otherwise in the procedural specification, the SC-MCCH information acquisition procedure overwrites any stored SC-MCCH information, i.e. delta configuration is not applicable for SC-MCCH information and the UE discontinues using a field if it is absent in SC-MCCH information unless explicitly specified otherwise.

5.8a.2.3 SC-MCCH information acquisition by the UE

A SC-PTM capable UE shall:

- 1> if the procedure is triggered by an SC-MCCH information change notification and the UE has no ongoing MBMS service:
 - 2> except for a BL UE, UE in CE or NB-IoT UE, start acquiring the *SCPTMConfiguration* message from the subframe in which the change notification was received;

- 2> for a BL UE, UE in CE or NB-IoT UE, acquire the SCPTMConfiguration message scheduled by the PDCCH in which the change notification was received;
- NOTE 1: The UE continues using the previously received SC-MCCH information until the new SC-MCCH information has been acquired.
- 1> if the UE enters a cell broadcasting *SystemInformationBlockType20* (*SystemInformationBlockType20-NB* in NB-IoT):
 - 2> acquire the SCPTMConfiguration message at the next repetition period;
- 1> if the UE is receiving an MBMS service via an SC-MRB:
 - 2> except for BL UE, UE in CE or NB-IoT UE, start acquiring the *SCPTMConfiguration* message from the beginning of each modification period;
 - 2> a BL UE, UE in CE or NB-IoT UE shall start acquiring the *SCPTMConfiguration* message at the start of the next modification period upon receiving a notification that the SC-MCCH information that corresponds with the service that is being received is about to be changed;
 - 2> a BL UE, UE in CE or NB-IoT UE may start acquiring the SCPTMConfiguration message at the start of the next modification period upon receiving a notification that the SC-MCCH information is about to be changed due to start of a new service;

5.8a.2.4 Actions upon reception of the SCPTMConfiguration message

No UE requirements related to the contents of this *SCPTMConfiguration* apply other than those specified elsewhere e.g. within procedures using the concerned system information, the corresponding field descriptions.

5.8a.3 SC-PTM radio bearer configuration

5.8a.3.1 General

The SC-PTM radio bearer configuration procedure is used by the UE to configure RLC, MAC and the physical layer upon starting and/or stopping to receive an SC-MRB transmitted on SC-MTCH. The procedure applies to SC-PTM capable UEs that are in RRC_IDLE and to SC-PTM capable UEs that are not BL UEs, UEs in CE or NB-IoT UEs in RRC_CONNECTED, and are interested to receive one or more MBMS services via SC-MRB.

NOTE: In case the UE is unable to receive an MBMS service via an SC-MRB due to capability limitations, upper layers may take appropriate action e.g. terminate a lower priority unicast service.

5.8a.3.2 Initiation

The UE applies the SC-MRB establishment procedure to start receiving a session of a MBMS service it has an interest in. The procedure may be initiated e.g. upon start of the MBMS session, upon entering a cell providing via SC-MRB a MBMS service in which the UE has interest, upon becoming interested in the MBMS service, upon removal of UE capability limitations inhibiting reception of the concerned service.

The UE applies the SC-MRB release procedure to stop receiving a session. The procedure may be initiated e.g. upon stop of the MBMS session, upon leaving the cell where a SC-MRB is established, upon losing interest in the MBMS service, when capability limitations start inhibiting reception of the concerned service.

5.8a.3.3 SC-MRB establishment

Upon SC-MRB establishment, the UE shall:

- 1> establish an RLC entity in accordance with the configuration specified in 9.1.1.7;
- 1> configure a SC-MTCH logical channel applicable for the SC-MRB and instruct MAC to receive DL-SCH on the cell where the *SCPTMConfiguration* message was received for the MBMS service for which the SC-MRB is established and using *g-RNTI* and *sc-mtch-SchedulingInfo* (if included) in this message for this MBMS service;

- 1> configure the physical layer in accordance with the *sc-mtch-InfoList*, applicable for the SC-MRB, as included in the *SCPTMConfiguration* message;
- 1> inform upper layers about the establishment of the SC-MRB by indicating the corresponding *tmgi* and *sessionId*;

5.8a.3.4 SC-MRB release

Upon SC-MRB release, the UE shall:

- 1> release the RLC entity as well as the related MAC and physical layer configuration;
- 1> inform upper layers about the release of the SC-MRB by indicating the corresponding *tmgi* and *sessionId*;

5.9 RN procedures

5.9.1 RN reconfiguration

5.9.1.1 General

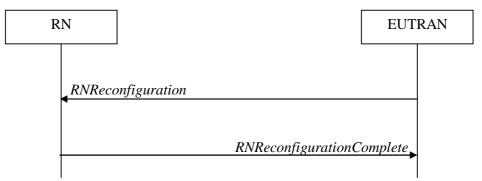


Figure 5.9.1.1-1: RN reconfiguration

The purpose of this procedure is to configure/reconfigure the RN subframe configuration and/or to update the system information relevant for the RN in RRC_CONNECTED.

5.9.1.2 Initiation

E-UTRAN may initiate the RN reconfiguration procedure to an RN in RRC_CONNECTED when AS security has been activated.

5.9.1.3 Reception of the RNReconfiguration by the RN

The RN shall:

- 1> if the *rn-SystemInfo* is included:
 - 2> if the *systemInformationBlockType1* is included:
 - 3> act upon the received *SystemInformationBlockType1* as specified in 5.2.2.7;
 - 2> if the *SystemInformationBlockType2* is included:
 - 3> act upon the received *SystemInformationBlockType2* as specified in 5.2.2.9;
- 1> if the *rn-SubframeConfig* is included:
 - 2> reconfigure lower layers in accordance with the received *subframeConfigPatternFDD* or *subframeConfigPatternTDD*;
 - 2> if the *rpdcch-Config* is included:

- 3> reconfigure lower layers in accordance with the received *rpdcch-Config*;
- 1> submit the *RNReconfigurationComplete* message to lower layers for transmission, upon which the procedure ends;

5.10 Sidelink

5.10.1 Introduction

The sidelink communication and associated synchronisation resource configuration applies for the frequency at which it was received/ acquired. Moreover, for a UE configured with one or more SCells, the sidelink communication and associated synchronisation resource configuration provided by dedicated signalling applies for the PCell/ the primary frequency. The sidelink discovery and associated synchronisation resource configuration applies for the frequency at which it was received/ acquired or the indicated frequency in the configuration. For a UE configured with one or more SCells, the sidelink discovery and associated synchronisation resource configuration provided by dedicated signalling applies for the PCell/ the primary frequency in the configuration provided by dedicated signalling applies for the PCell/ the primary frequency / any other indicated frequency.

- NOTE 1: Upper layers configure the UE to receive or transmit sidelink communication on a specific frequency, to monitor or transmit non-PS related sidelink discovery announcements on one or more frequencies or to monitor or transmit PS related sidelink discovery announcements on a specific frequency, but only if the UE is authorised to perform these particular ProSe related sidelink activities.
- NOTE 2: It is up to UE implementation which actions to take (e.g. termination of unicast services, detach) when it is unable to perform the desired sidelink activities, e.g. due to UE capability limitations.

Sidelink communication consists of one-to-many and one-to-one sidelink communication. One-to-many sidelink communication consists of relay related and non-relay related one-to-many sidelink communication. One-to-one sidelink communication consists of relay related and non-relay related one-to-one sidelink communication. In relay related one-to-one sidelink communication the communicating parties consist of one sidelink relay UE and one sidelink remote UE.

Sidelink discovery consists of public safety related (PS related) and non-PS related sidelink discovery. PS related sidelink discovery consists of relay related and non-relay related PS related sidelink discovery. Upper layers indicate to RRC whether a particular sidelink announcement is PS related or non-PS related.

Upper layers indicate to RRC whether a particular sidelink procedure is V2X related or not.

The specification covers the use of UE to network sidelink relays by specifying the additional requirements that apply for a sidelink relay UE and a sidelink remote UE. I.e. for such UEs the regular sidelink UE requirements equally apply unless explicitly stated otherwise.

5.10.1a Conditions for sidelink communication operation

When it is specified that the UE shall perform sidelink communication operation only if the conditions defined in this clause are met, the UE shall perform sidelink communication operation only if:

- 1> if the UE's serving cell is suitable (RRC_IDLE or RRC_CONNECTED); and if either the selected cell on the frequency used for sidelink communication operation belongs to the registered or equivalent PLMN as specified in TS 24.334 [69] or the UE is out of coverage on the frequency used for sidelink communication operation as defined in TS 36.304 [4], clause 11.4; or
- 1> if the UE is camped on a serving cell (RRC_IDLE) on which it fulfils the conditions to support sidelink communication in limited service state as specified in TS 23.303 [68], clause 4.5.6; and if either the serving cell is on the frequency used for sidelink communication operation or the UE is out of coverage on the frequency used for sidelink communication as defined in TS 36.304 [4], clause 11.4; or

1> if the UE has no serving cell (RRC_IDLE);

5.10.1b Conditions for PS related sidelink discovery operation

When it is specified that the UE shall perform PS related sidelink discovery operation only if the conditions defined in this clause are met, the UE shall perform PS related sidelink discovery operation only if:

- 1> if the UE's serving cell is suitable (RRC_IDLE or RRC_CONNECTED); and if either the selected cell on the frequency used for PS related sidelink discovery operation belongs to the registered or other PLMN as specified in TS 24.334 [69] or the UE is out of coverage on the frequency used for PS related sidelink discovery operation as defined in TS 36.304 [4], clause 11.4; or
- 1> if the UE is camped on a serving cell (RRC_IDLE) on which it fulfils the conditions to support sidelink discovery in limited service state as specified in TS 23.303 [68], clause 4.5.6; and if either the serving cell is on the frequency used for PS related sidelink discovery operation or the UE is out of coverage on the frequency used for PS related sidelink discovery operation as defined in TS 36.304 [4], clause 11.4; or
- 1> if the UE has no serving cell (RRC_IDLE);

5.10.1c Conditions for non-PS related sidelink discovery operation

When it is specified that the UE shall perform non-PS related sidelink discovery operation only if the conditions defined in this clause are met, the UE shall perform non-PS related sidelink discovery operation only if:

1> if the UE's serving cell (RRC_IDLE) or PCell (RRC_CONNECTED) is suitable; and if the selected cell on the frequency used for non-PS related sidelink discovery operation belongs to the registered or other PLMN as specified in TS 24.334 [69].

5.10.1d Conditions for V2X sidelink communication operation

When it is specified that the UE shall perform V2X sidelink communication operation only if the conditions defined in this clause are met, the UE shall perform V2X sidelink communication operation only if:

- 1> if the UE's serving cell is suitable (RRC_IDLE or RRC_CONNECTED); and if either the selected cell on the frequency used for V2X sidelink communication operation belongs to the registered or equivalent PLMN as specified in TS 24.334 [69] or the UE is out of coverage on the frequency used for V2X sidelink communication operation as defined in TS 36.304 [4], clause 11.4; or
- 1> if the UE's serving cell (for RRC_IDLE or RRC_CONNECTED) fulfils the conditions to support V2X sidelink communication in limited service state as specified in TS 23.285 [78], clause 4.4.8; and if either the serving cell is on the frequency used for V2X sidelink communication operation or the UE is out of coverage on the frequency used for V2X sidelink communication operation as defined in TS 36.304 [4], clause 11.4; or
- 1> if the UE has no serving cell (RRC_IDLE);

5.10.2 Sidelink UE information

5.10.2.1 General

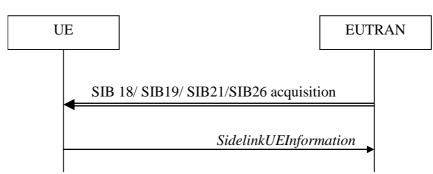


Figure 5.10.2-1: Sidelink UE information

The purpose of this procedure is to inform E-UTRAN that the UE is interested or no longer interested to receive sidelink communication or discovery, to receive V2X sidelink communication, as well as to request assignment or release of transmission resources for sidelink communication or discovery announcements or V2X sidelink communication or sidelink discovery gaps, to report parameters related to sidelink discovery from system information of inter-frequency/PLMN cells and to report the synchronization reference used by the UE for V2X sidelink communication.

5.10.2.2 Initiation

A UE capable of sidelink communication or V2X sidelink communication or sidelink discovery that is in RRC_CONNECTED may initiate the procedure to indicate it is (interested in) receiving sidelink communication or V2X sidelink communication or sidelink discovery in several cases including upon successful connection establishment, upon change of interest, upon change to a PCell broadcasting *SystemInformationBlockType18* or *SystemInformationBlockType19* or *SystemInformationBlockType21* including *sl-V2X-ConfigCommon*. A UE capable of sidelink communication or v2X sidelink communication or sidelink discovery may initiate the procedure to request assignment of dedicated resources for the concerned sidelink communication transmission or discovery transmission or sidelink discovery gaps for sidelink discovery transmission or sidelink discovery reception and a UE capable of inter-frequency/PLMN sidelink discovery parameter reporting may initiate the procedure to request reporting may initiate the procedure to request reporting may initiate the procedure to report parameters related to sidelink discovery from system information of inter-frequency/PLMN cells.

NOTE 1: A UE in RRC_IDLE that is configured to transmit sidelink communication / V2X sidelink communication / sidelink discovery announcements, while SystemInformationBlockType18/ SystemInformationBlockType19/ SystemInformationBlockType21 including sl-V2X-ConfigCommon or SystemInformationBlockType26 does not include the resources for transmission (in normal conditions), initiates connection establishment in accordance with 5.3.3.1a.

Upon initiating the procedure, the UE shall:

- 1> if *SystemInformationBlockType18* is broadcast by the PCell:
 - 2> ensure having a valid version of *SystemInformationBlockType18* for the PCell;
 - 2> if configured by upper layers to receive sidelink communication:
 - 3> if the UE did not transmit a *SidelinkUEInformation* message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType18; or
- NOTE 2: After handover/ re-establishment from a source PCell not broadcasting *SystemInformationBlockType18* the UE repeats the same interest information that it provided previously as such a source PCell may not forward the interest information.
 - 3> if the last transmission of the *SidelinkUEInformation* message did not include *commRxInterestedFreq*; or if the frequency configured by upper layers to receive sidelink communication on has changed since the last transmission of the *SidelinkUEInformation* message:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate the sidelink communication reception frequency of interest in accordance with 5.10.2.3;

- 3> if the last transmission of the *SidelinkUEInformation* message included *commRxInterestedFreq*:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it is no longer interested in sidelink communication reception in accordance with 5.10.2.3;
- 2> if configured by upper layers to transmit non-relay related one-to-many sidelink communication:
 - 3> if the UE did not transmit a SidelinkUEInformation message since last entering RRC_CONNECTED state; or

- 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType18; or
- 3> if the last transmission of the SidelinkUEInformation message did not include commTxResourceReq; or if the information carried by the commTxResourceReq has changed since the last transmission of the SidelinkUEInformation message:
 - 4> initiate transmission of the SidelinkUEInformation message to indicate the non-relay related one-tomany sidelink communication transmission resources required by the UE in accordance with 5.10.2.3;

- 3> if the last transmission of the *SidelinkUEInformation* message included *commTxResourceReq*:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires non-relay related one-to-many sidelink communication transmission resources in accordance with 5.10.2.3;
- 2> if configured by upper layer to transmit relay related one-to-many sidelink communication:
 - 3> if the UE did not transmit a SidelinkUEInformation message since entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType18, connected to a PCell not broadcasting SystemInformationBlockType19 or broadcasting SystemInformationBlockType19 not including discConfigRelay; or
 - 3> if the last transmission of *SidelinkUEInformation* message did not include *commTxResourceReqRelay*; or if the information carried by the *commTxResourceReqRelay* has changed since the last transmission of the *SidelinkUEInformation* message:
 - 4> if the UE is acting as sidelink relay UE:
 - 5> initiate transmission of the *SidelinkUEInformation* message to indicate the relay related one-tomany sidelink communication transmission resources required by the UE in accordance with 5.10.2.3;

2> else:

- 3> if the last transmission of the SidelinkUEInformation message included commTxResourceReqRelay:
 - 4> initiate transmission of the SidelinkUEInformation message to indicate it no longer requires relay related one-to-many sidelink communication transmission resources in accordance with 5.10.2.3;
- 2> if configured by upper layers to transmit non-relay related one-to-one sidelink communication:
 - 3> if the UE did not transmit a *SidelinkUEInformation* message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType18 or connected to a PCell broadcasting SystemInformationBlockType18 not including commTxResourceUC-ReqAllowed; or
 - 3> if the last transmission of the *SidelinkUEInformation* message did not include *commTxResourceReqUC*; or if the information carried by the *commTxResourceReqUC* has changed since the last transmission of the *SidelinkUEInformation* message:
 - 4> if commTxResourceUC-ReqAllowed is included in SystemInformationBlockType18:
 - 5> initiate transmission of the *SidelinkUEInformation* message to indicate the non-relay related oneto-one sidelink communication transmission resources required by the UE in accordance with 5.10.2.3;

2> else:

3> if the last transmission of the SidelinkUEInformation message included commTxResourceReqUC:

- 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires non-relay related one-to-one sidelink communication transmission resources in accordance with 5.10.2.3;
- 2> if configured by upper layers to transmit relay related one-to-one sidelink communication:
 - 3> if the UE did not transmit a SidelinkUEInformation message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType18, connected to a PCell not broadcasting SystemInformationBlockType19 or broadcasting SystemInformationBlockType19 not including discConfigRelay; or
 - 3> if the last transmission of the *SidelinkUEInformation* message did not include *commTxResourceReqRelayUC*; or if the information carried by the *commTxResourceReqRelayUC* has changed since the last transmission of the *SidelinkUEInformation* message:
 - 4> if the UE is acting as sidelink relay UE; or
 - 4> if the UE has a selected sidelink relay UE; and if SystemInformationBlockType19 is broadcast by the PCell and includes discConfigRelay; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met;
 - 5> initiate transmission of the *SidelinkUEInformation* message to indicate the relay related one-to-one sidelink communication transmission resources required by the UE in accordance with 5.10.2.3;

- 3> if the last transmission of the SidelinkUEInformation message included commTxResourceReqRelayUC:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires relay related one-to-one sidelink communication transmission resources in accordance with 5.10.2.3;
- 1> if *SystemInformationBlockType19* is broadcast by the PCell:
 - 2> ensure having a valid version of *SystemInformationBlockType19* for the PCell;
 - 2> if configured by upper layers to receive sidelink discovery announcements on a serving frequency or on one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19* of the PCell:
 - 3> if the UE did not transmit a *SidelinkUEInformation* message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType19; or
 - 3> if the last transmission of the SidelinkUEInformation message did not include discRxInterest:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it is interested in sidelink discovery reception in accordance with 5.10.2.3;

- 3> if the last transmission of the SidelinkUEInformation message included discRxInterest:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it is no longer interested in sidelink discovery reception in accordance with 5.10.2.3;
- 2> if the UE is configured by upper layers to transmit non-PS related sidelink discovery announcements on the primary frequency or on one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19* of the PCell, with *discTxResourcesInterFreq* included within *discResourcesNonPS* and not set to *noTxOnCarrier*:
 - 3> if the UE did not transmit a *SidelinkUEInformation* message since last entering RRC_CONNECTED state; or

- 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType19 or connected to a PCell broadcasting SystemInformationBlockType19 not including discTxResourcesInterFreq within discResourcesNonPS or discTxResourcesInterFreq did not include all frequencies for which the UE will request resources; or
- 3> if the last transmission of the *SidelinkUEInformation* message did not include *discTxResourceReq*; or if the non-PS related sidelink discovery announcement resources required by the UE have changed (i.e. resulting in a change of *discTxResourceReq*) since the last transmission of the *SidelinkUEInformation* message:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate the non-PS related sidelink discovery announcement resources required by the UE in accordance with 5.10.2.3;

- 3> if the last transmission of the SidelinkUEInformation message included discTxResourceReq:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires non-PS related sidelink discovery announcement resources in accordance with 5.10.2.3;
- 2> if configured by upper layers to transmit PS related sidelink discovery announcements on the primary frequency or, in case of non-relay PS related sidelink discovery announcements, on a frequency included in *discInterFreqList*, if included in *SystemInformationBlockType19*, with *discTxResourcesInterFreq* included within *discResourcesPS* and not set to *noTxOnCarrier*:
 - 3> if the UE did not transmit a *SidelinkUEInformation* message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType19, connected to a PCell broadcasting SystemInformationBlockType19 not including discConfigPS, or in case of non-relay PS related transmission: (connected to a PCell broadcasting SystemInformationBlockType19 not including discTxResourcesInterFreq within discResourcesPS or for which discTxResourcesInterFreq did not include all frequencies for which the UE will request resources), or in case of relay related PS sidelink discovery announcements: (connected to a PCell broadcasting SystemInformationBlockType19 not including discConfigRelay) sidelink; or
 - 3> if the last transmission of the SidelinkUEInformation message did not include discTxResourceReqPS; or if the PS related sidelink discovery announcement resources required by the UE have changed (i.e. resulting in a change of discTxResourceReqPS) since the last transmission of the SidelinkUEInformation message:
 - 4> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements; or
 - 4> if the UE is acting as sidelink relay UE; and if SystemInformationBlockType19 includes discConfigRelay; and if the sidelink relay UE threshold conditions as specified in 5.10.10.4 are met; or
 - 4> if the UE is selecting a sidelink relay UE / has a selected sidelink relay UE; and if SystemInformationBlockType19 includes discConfigRelay; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met:
 - 5> initiate transmission of the *SidelinkUEInformation* message to indicate the PS related sidelink discovery announcement resources required by the UE in accordance with 5.10.2.3;

- 3> if the last transmission of the SidelinkUEInformation message included discTxResourceReqPS:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires PS related sidelink discovery announcement resources in accordance with 5.10.2.3;
- 2> if configured by upper layers to monitor or transmit sidelink discovery announcements; and if the UE requires sidelink discovery gaps, to perform such actions:
 - 3> if the UE did not transmit a *SidelinkUEInformation* message since last entering RRC_CONNECTED state; or

- 3> if since the last time the UE transmitted a SidelinkUEInformation message the UE connected to a PCell not broadcasting SystemInformationBlockType19 or connected to a PCell broadcasting SystemInformationBlockType19 not including gapRequestsAllowedCommon while at the same time the UE was not configured with gapRequestsAllowedDedicated; or
- 3> if the last transmission of the *SidelinkUEInformation* message did not include the gaps required to monitor or transmit the sidelink discovery announcements (i.e. UE requiring gaps to monitor discovery announcements while *discRxGapReq* was not included or UE requiring gaps to transmit discovery announcements while *discTxGapReq* was not included); or if the sidelink discovery gaps required by the UE have changed (i.e. resulting in a change of *discRxGapReq* or *discTxGapReq*) since the last transmission of the *SidelinkUEInformation* message:
 - 4> if the UE is configured with gapRequestsAllowedDedicated set to true; or
 - 4> if the UE is not configured with gapRequestsAllowedDedicated and gapRequestsAllowedCommon is included in SystemInformationBlockType19:
 - 5> initiate transmission of the *SidelinkUEInformation* message to indicate the sidelink discovery gaps required by the UE in accordance with 5.10.2.3;

- 3> if the last transmission of the SidelinkUEInformation message included discTxGapReq or discRxGapReq:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires sidelink discovery gaps in accordance with 5.10.2.3;
- 2> if the UE acquired the relevant parameters from the system information of one or more cells on a carrier included in the *discSysInfoToReportConfig* and T370 is running:
 - 3> if the UE has configured lower layers to transmit or monitor the sidelink discovery announcements on those cells:
 - 4> initiate transmission of the *SidelinkUEInformation* message to report the acquired system information parameters and stop T370;
- 1> if SystemInformationBlockType21 including sl-V2X-ConfigCommon is broadcast by the PCell:
 - 2> ensure having a valid version of *SystemInformationBlockType21* and *SystemInformationBlockType26*, if broadcast, for the PCell;
 - 2> if configured by upper layers to receive V2X sidelink communication on a primary frequency or on one or more frequencies included in v2x-InterFreqInfoList, if included in SystemInformationBlockType21 or SystemInformationBlockType26 of the PCell:
 - 3> if the UE did not transmit a SidelinkUEInformation message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a *SidelinkUEInformation* message the UE connected to a PCell not broadcasting *SystemInformationBlockType21* including *sl-V2X-ConfigCommon*; or
 - 3> if the last transmission of the *SidelinkUEInformation* message did not include *v2x*-*CommRxInterestedFreqList*; or if the frequency(ies) configured by upper layers to receive V2X sidelink communication on has changed since the last transmission of the *SidelinkUEInformation* message:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate the V2X sidelink communication reception frequency(ies) of interest in accordance with 5.10.2.3;

- 3> if the last transmission of the SidelinkUEInformation message included v2x-CommRxInterestedFreqList:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it is no longer interested in V2X sidelink communication reception in accordance with 5.10.2.3;

- 2> if configured by upper layers to transmit V2X sidelink communication on a primary frequency or on one or more frequencies included in v2x-InterFreqInfoList, if included in SystemInformationBlockType21 or SystemInformationBlockType26 of the PCell:
 - 3> if the UE did not transmit a SidelinkUEInformation message since last entering RRC_CONNECTED state; or
 - 3> if since the last time the UE transmitted a *SidelinkUEInformation* message the UE connected to a PCell not broadcasting *SystemInformationBlockType21* including *sl-V2X-ConfigCommon*; or
 - 3> if the last transmission of the *SidelinkUEInformation* message did not include v2x-CommTxResourceReq; or if the information carried by the v2x-CommTxResourceReq has changed since the last transmission of the *SidelinkUEInformation* message:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate the V2X sidelink communication transmission resources required by the UE in accordance with 5.10.2.3;

2> else:

- 3> if the last transmission of the *SidelinkUEInformation* message included v2x-CommTxResourceReq:
 - 4> initiate transmission of the *SidelinkUEInformation* message to indicate it no longer requires V2X sidelink communication transmission resources in accordance with 5.10.2.3;

5.10.2.3 Actions related to transmission of SidelinkUEInformation message

The UE shall set the contents of the SidelinkUEInformation message as follows:

- 1> if the UE initiates the procedure to indicate it is (no more) interested to receive sidelink communication or discovery or receive V2X sidelink communication or to request (configuration/ release) of sidelink communication or V2X sidelink communication or sidelink discovery transmission resources (i.e. UE includes all concerned information, irrespective of what triggered the procedure):
 - 2> if *SystemInformationBlockType18* is broadcast by the PCell:
 - 3> if configured by upper layers to receive sidelink communication:
 - 4> include *commRxInterestedFreq* and set it to the sidelink communication frequency;
 - 3> if configured by upper layers to transmit non-relay related one-to-many sidelink communication:
 - 4> include *commTxResourceReq* and set its fields as follows:
 - 5> set *carrierFreq* to indicate the sidelink communication frequency i.e. the same value as indicated in *commRxInterestedFreq* if included;
 - 5> set *destinationInfoList* to include the non-relay related one-to-many sidelink communication transmission destination(s) for which it requests E-UTRAN to assign dedicated resources;
 - 3> if configured by upper layers to transmit non-relay related one-to-one sidelink communication; and
 - 3> if commTxResourceUC-ReqAllowed is included in SystemInformationBlockType18:
 - 4> include *commTxResourceReqUC* and set its fields as follows:
 - 5> set *carrierFreq* to indicate the one-to-one sidelink communication frequency i.e. the same value as indicated in *commRxInterestedFreq* if included;
 - 5> set *destinationInfoList* to include the non-relay related one-to-one sidelink communication transmission destination(s) for which it requests E-UTRAN to assign dedicated resources;
 - 3> if configured by upper layers to transmit relay related one-to-one sidelink communication; and
 - 3> if SystemInformationBlockType19 is broadcast by the PCell including discConfigRelay; and

- 3> if the UE is acting as sidelink relay UE; or if the UE has a selected sidelink relay UE; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met:
 - 4> include *commTxResourceReqRelayUC* and set its fields as follows:
 - 5> set destinationInfoList to include the one-to-one sidelink communication transmission destination(s) for which it requests E-UTRAN to assign dedicated resources;
 - 4> include ue-Type and set it to relayUE if the UE is acting as sidelink relay UE and to remoteUE otherwise;
- 3> if configured by upper layers to transmit relay related one-to-many sidelink communication; and
- 3> if SystemInformationBlockType19 is broadcast by the PCell including discConfigRelay; and
- 3> if the UE is acting as sidelink relay UE:
 - 4> include *commTxResourceReqRelay* and set its fields as follows:
 - 5> set *destinationInfoList* to include the one-to-many sidelink communication transmission destination(s) for which it requests E-UTRAN to assign dedicated resources;
 - 4> include *ue-Type* and set it to *relayUE*;
- 2> if SystemInformationBlockType19 is broadcast by the PCell:
 - 3> if configured by upper layers to receive sidelink discovery announcements on a serving frequency or one or more frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19*:
 - 4> include discRxInterest;
 - 3> if the UE is configured by upper layers to transmit non-PS related sidelink discovery announcements:
 - 4> for each frequency on which the UE is configured to transmit non-PS related sidelink discovery announcements that concerns the primary frequency or that is included in *discInterFreqList* with *discTxResourcesInterFreq* included within *discResourcesNonPS* and not set to *noTxOnCarrier*.
 - 5> for the first frequency, include *discTxResourceReq* and set it to indicate the number of discovery messages for sidelink discovery announcement(s) for which it requests E-UTRAN to assign dedicated resources as well as the concerned frequency, if different from the primary;
 - 5> for any additional frequency, include *discTxResourceReqAddFreq* and set it to indicate the number of discovery messages for sidelink discovery announcement(s) for which it requests E-UTRAN to assign dedicated resources as well as the concerned frequency;
 - 3> if configured by upper layers to transmit PS related sidelink discovery announcements; and
 - 3> if the frequency on which the UE is configured to transmit PS related sidelink discovery announcements either concerns the primary frequency or, in case of non-relay PS related sidelink discovery announcements, is included in *discInterFreqList* with *discTxResources InterFreq* included within *discResourcesPS* and not set to *noTxOnCarrier*:
 - 4> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements and SystemInformationBlockType19 includes discConfigPS; or
 - 4> if the UE is acting as sidelink relay UE; and if SystemInformationBlockType19 includes discConfigRelay; and if the sidelink relay UE threshold conditions as specified in 5.10.10.4 are met; or
 - 4> if the UE is selecting a sidelink relay UE / has a selected sidelink relay UE; and if SystemInformationBlockType19 includes discConfigRelay; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met:
 - 5> include *discTxResourceReqPS* and set it to indicate the number of discovery messages for PS related sidelink discovery announcement(s) for which it requests E-UTRAN to assign dedicated resources as well as the concerned frequency, if different from the primary;

- 2> if *SystemInformationBlockType21* is broadcast by the PCell and *SystemInformationBlockType21* includes *sl-V2X-ConfigCommon*:
 - 3> if configured by upper layers to receive V2X sidelink communication:
 - 4> include v2x-CommRxInterestedFreqList and set it to the frequency(ies) for V2X sidelink communication reception;
 - 3> if configured by upper layers to transmit V2X sidelink communication:
 - 4> if configured by upper layers to transmit P2X related V2X sidelink communication:
 - 5> include *p2x-CommTxType* set to *true*;
 - 4> include *v2x-CommTxResourceReq* and set its fields as follows for each frequency on which the UE is configured for V2X sidelink communication transmission:
 - 5> set *carrierFreqCommTx* to indicate the frequency for V2X sidelink communication transmission;
 - 5> set v2x-TypeTxSync to the current synchronization reference type used on the associated *carrierFreqCommTx* for V2X sidelink communication transmission;
 - 5> set *v2x-DestinationInfoList* to include the V2X sidelink communication transmission destination(s) for which it requests E-UTRAN to assign dedicated resources;

1> else if the UE initiates the procedure to request sidelink discovery transmission and/ or reception gaps:

- 2> if the UE is configured with gapRequestsAllowedDedicated set to true; or
- 2> if the UE is not configured with *gapRequestsAllowedDedicated* and *gapRequestsAllowedCommon* is included in *SystemInformationBlockType19*:
 - 3> if the UE requires sidelink discovery gaps to monitor the sidelink discovery announcements the UE is configured to monitor by upper layers:
 - 4> include *discRxGapReq* and set it to indicate, for each frequency that either concerns the primary frequency or is included in *discInterFreqList* on which the UE is configured to monitor sidelink discovery announcements and for which it requires sidelink discovery gaps to do so, the gap pattern(s) as well as the concerned frequency, if different from the primary;
 - 3> if the UE requires sidelink discovery gaps to transmit the sidelink discovery announcements the UE is configured to transmit by upper layers:
 - 4> include *discTxGapReq* and set it to indicate, for each frequency that either concerns the primary or is included in *discInterFreqList* on which the UE is configured to transmit sidelink discovery announcements and for which it requires sidelink discovery gaps to do so, the gap pattern(s) as well as the concerned frequency, if different from the primary;
- 1> else if the UE initiates the procedure to report the system information parameters related to sidelink discovery of carriers other than the primary:
 - 2> include *discSysInfoReportFreqList* and set it to report the system information parameter acquired from the cells on those carriers;

The UE shall submit the SidelinkUEInformation message to lower layers for transmission.

5.10.3 Sidelink communication monitoring

A UE capable of sidelink communication that is configured by upper layers to receive sidelink communication shall:

- 1> if the conditions for sidelink communication operation as defined in 5.10.1a are met:
 - 2> if in coverage on the frequency used for sidelink communication, as defined in TS 36.304 [4], clause 11.4:
 - 3> if the cell chosen for sidelink communication reception broadcasts *SystemInformationBlockType18* including *commRxPool*:

- 4> configure lower layers to monitor sidelink control information and the corresponding data using the pool of resources indicated by *commRxPool*;
- NOTE 1: If *commRxPool* includes one or more entries including *rxParametersNCell*, the UE may only monitor such entries if the associated PSS/SSS or SLSSIDs is detected. When monitoring such pool(s), the UE applies the timing of the concerned PSS/SSS or SLSS.
 - 2> else (i.e. out of coverage on the sidelink carrier):
 - 3> configure lower layers to monitor sidelink control information and the corresponding data using the pool of resources that were preconfigured (i.e. *preconfigComm* in *SL-Preconfiguration* defined in 9.3);
- NOTE 2: The UE may monitor in accordance with the timing of the selected SyncRef UE, or if the UE does not have a selected SyncRef UE, based on the UE's own timing.

5.10.4 Sidelink communication transmission

A UE capable of sidelink communication that is configured by upper layers to transmit non-relay related sidelink communication and has related data to be transmitted or a UE capable of relay related sidelink communication that is configured by upper layers to transmit relay related sidelink communications and satisfies the conditions for relay related sidelink communication specified in this clause shall:

- 1> if the conditions for sidelink communication operation as defined in 5.10.1a are met:
 - 2> if in coverage on the frequency used for sidelink communication, as defined in TS 36.304 [4], clause 11.4:
 - 3> if the UE is in RRC_CONNECTED and uses the PCell for sidelink communication:
 - 4> if the UE is configured, by the current PCell/ the PCell in which physical layer problems or radio link failure was detected, with *commTxResources* set to *scheduled*:
 - 5> if T310 or T311 is running; and if the PCell at which the UE detected physical layer problems or radio link failure broadcasts *SystemInformationBlockType18* including *commTxPoolExceptional*; or
 - 5> if T301 is running and the cell on which the UE initiated connection re-establishment broadcasts *SystemInformationBlockType18* including *commTxPoolExceptional*:
 - 6> configure lower layers to transmit the sidelink control information and the corresponding data using the pool of resources indicated by the first entry in *commTxPoolExceptional*;
 - 5> else:
 - 6> configure lower layers to request E-UTRAN to assign transmission resources for sidelink communication;
 - 4> else if the UE is configured with commTxPoolNormalDedicated or commTxPoolNormalDedicatedExt:
 - 5> if *priorityList* is included for the entries of *commTxPoolNormalDedicated* or *commTxPoolNormalDedicatedExt*:
 - 6> configure lower layers to transmit the sidelink control information and the corresponding data using the one or more pools of resources indicated by *commTxPoolNormalDedicated* or *commTxPoolNormalDedicatedExt* i.e. indicate all entries of this field to lower layers;
 - 5> else:
 - 6> configure lower layers to transmit the sidelink control information and the corresponding data using the pool of resources indicated by the first entry in *commTxPoolNormalDedicated*;
 - 3> else (i.e. sidelink communication in RRC_IDLE or on cell other than PCell in RRC_CONNECTED):
 - 4> if the cell chosen for sidelink communication transmission broadcasts SystemInformationBlockType18:
 - 5> if SystemInformationBlockType18 includes commTxPoolNormalCommon:
 - 6> if *priorityList* is included for the entries of *commTxPoolNormalCommon* or *commTxPoolNormalCommonExt*:
 - 7> configure lower layers to transmit the sidelink control information and the corresponding data using the one or more pools of resources indicated by *commTxPoolNormalCommon* and/or *commTxPoolNormalCommonExt* i.e. indicate all entries of these fields to lower layers;
 - 6> else:
 - 7> configure lower layers to transmit the sidelink control information and the corresponding data using the pool of resources indicated by the first entry in *commTxPoolNormalCommon*;

- 5> else if SystemInformationBlockType18 includes commTxPoolExceptional:
 - 6> from the moment the UE initiates connection establishment until receiving an RRCConnectionReconfiguration including sl-CommConfig or until receiving an RRCConnectionRelease or an RRCConnectionReject;
 - 7> configure lower layers to transmit the sidelink control information and the corresponding data using the pool of resources indicated by the first entry in *commTxPoolExceptional*;
- 2> else (i.e. out of coverage on sidelink carrier):
 - 3> if *priorityList* is included for the entries of *preconfigComm* in *SL-Preconfiguration* defined in 9.3:
 - 4> configure lower layers to transmit the sidelink control information and the corresponding data using the one or more pools of resources indicated *preconfigComm* i.e. indicate all entries of this field to lower layers and in accordance with the timing of the selected SyncRef UE, or if the UE does not have a selected SyncRef UE, based on the UEs own timing;
 - 3> else:
 - 4> configure lower layers to transmit the sidelink control information and the corresponding data using the pool of resources that were preconfigured i.e. indicated by the first entry in *preconfigComm* in *SL*-*Preconfiguration* defined in 9.3 and in accordance with the timing of the selected SyncRef UE, or if the UE does not have a selected SyncRef UE, based on the UEs own timing;

The conditions for relay related sidelink communication are as follows:

- 1> if the transmission concerns sidelink relay communication; and the UE is capable of sidelink relay or sidelink remote operation:
 - 2> if the UE is in RRC_IDLE; and if the UE has a selected sidelink relay UE: configure lower layers to transmit the sidelink control information and the corresponding data using the resources, as specified previously in this clause, only if the following condition is met:
 - 3> if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met; and if the UE configured lower layers with a pool of resources included in *SystemInformationBlockType18* (i.e. *commTxPoolNormalCommon, commTxPoolNormalCommonExt* or *commTxPoolExceptional*); and *commTxAllowRelayCommon* is included in *SystemInformationBlockType18*;
 - 2> if the UE is in RRC_CONNECTED: configure lower layers to transmit the sidelink control information and the corresponding data using the resources, as specified previously in this clause, only if the following condition is met:
 - 3> if the UE configured lower layers with resources provided by dedicated signalling (i.e. commTxResources); and the UE is configured with commTxAllowRelayDedicated set to true;

5.10.5 Sidelink discovery monitoring

A UE capable of non-PS related sidelink discovery that is configured by upper layers to monitor non-PS related sidelink discovery announcements shall:

- 1> for each frequency the UE is configured to monitor non-PS related sidelink discovery announcements on, prioritising the frequencies included in *discInterFreqList*, if included in *SystemInformationBlockType19*:
 - 2> if the PCell or the cell the UE is camping on indicates the pool of resources to monitor sidelink discovery announcements on by discRxResourcesInterFreq in discResourcesNonPS within discInterFreqList in SystemInformationBlockType19:
 - 3> configure lower layers to monitor sidelink discovery announcements using the pool of resources indicated by discRxResourcesInterFreqin discResourcesNonPS within SystemInformationBlockType19;
 - 2> else if the cell used for sidelink discovery monitoring broadcasts SystemInformationBlockType19:

- 3> configure lower layers to monitor sidelink discovery announcements using the pool of resources indicated by *discRxPool* in *SystemInformationBlockType19*;
- 2> if the UE is configured with *discRxGapConfig* and requires sidelink discovery gaps to monitor sidelink discovery announcements on the concerned frequency;
 - 3> configure lower layers to monitor the concerned frequency using the sidelink discovery gaps indicated by *discRxGapConfig*;

3> configure lower layers to monitor the concerned frequency without affecting normal operation;

A UE capable of PS related sidelink discovery that is configured by upper layers to monitor PS related sidelink discovery announcements shall:

- 1> if out of coverage on the frequency, as defined in TS 36.304 [4], clause 11.4:
 - 2> configure lower layers to monitor sidelink discovery announcements using the pool of resources that were preconfigured (i.e. indicated by *discRxPoolList* within *preconfigDisc* in *SL-Preconfiguration* defined in 9.3);
- 1> else if configured by upper layers to monitor non-relay PS related discovery announcements; and if the PCell or the cell the UE is camping on indicates a pool of resources to monitor sidelink discovery announcements on by *discRxResourcesInterFreq* in *discResourcesPS* within *discInterFreqList* in *SystemInformationBlockType19*:
 - 2> configure lower layers to monitor sidelink discovery announcements using the pool of resources indicated by *discRxResourcesInterFreq* in *discResourcesPS* in *SystemInformationBlockType19*;
- 1> else if configured by upper layers to monitor PS related sidelink discovery announcements; and if the cell used for sidelink discovery monitoring broadcasts *SystemInformationBlockType19*:
 - 2> configure lower layers to monitor sidelink discovery announcements using the pool of resources indicated by discRxPoolPS in SystemInformationBlockType19;
- 1> if the UE is configured with *discRxGapConfig* and requires sidelink discovery gaps to monitor sidelink discovery announcements on the concerned frequency;
 - 2> configure lower layers to monitor the concerned frequency using the sidelink discovery gaps indicated by *discRxGapConfig*;

1> else:

2> configure lower layers to monitor the concerned frequency without affecting normal operation;

- NOTE 1: The requirement not to affect normal UE operation also applies for the acquisition of sidelink discovery related system and synchronisation information from inter-frequency cells.
- NOTE 2: The UE is not required to monitor all pools simultaneously.
- NOTE 3: It is up to UE implementation to decide whether a cell is sufficiently good to be used to monitor sidelink discovery announcements.
- NOTE 4: If *discRxPool, discRxPoolPS* or *discRxResourcesInterFreq* includes one or more entries including *rxParameters*, the UE may only monitor such entries if the associated SLSSIDs are detected. When monitoring such pool(s) the UE applies the timing of the corresponding SLSS.

5.10.6 Sidelink discovery announcement

A UE capable of non-PS related sidelink discovery that is configured by upper layers to transmit non-PS related sidelink discovery announcements shall, for each frequency the UE is configured to transmit such announcements on:

- NOTE: In case the configured resources are insufficient it is up to UE implementation to decide which sidelink discovery announcements to transmit.
- 1> if the frequency used to transmit sidelink discovery announcements concerns the serving frequency (RRC_IDLE) or primary frequency (RRC_CONNECTED):

2> if the UE's serving cell (RRC_IDLE) or PCell (RRC_CONNECTED) is suitable as defined in TS 36.304 [4]:

3> if the UE is in RRC_CONNECTED (i.e. PCell is used for sidelink discovery announcement):

- 4> if the UE is configured with *discTxResources* set to *scheduled*:
 - 5> configure lower layers to transmit the sidelink discovery announcement using the assigned resources indicated by *scheduled* in *discTxResources*;
- 4> else if the UE is configured with *discTxPoolDedicated* (i.e. *discTxResources* set to *ue-Selected*):
 - 5> select an entry of the list of resource pool entries in *discTxPoolDedicated* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 3> else if T300 is not running (i.e. UE in RRC_IDLE, announcing via serving cell):
 - 4> if SystemInformationBlockType19 of the serving cell includes discTxPoolCommon:
 - 5> select an entry of the list of resource pool entries in *discTxPoolCommon* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 1> else if, for the frequency used to transmit sidelink discovery announcements on, the UE is configured with dedicated resources (i.e. with *discTxResources-r12*, if *discTxCarrierFreq* is included in *discTxInterFreqInfo*, or with *discTxResources* within *discTxInfoInterFreqListAdd* in *discTxInterFreqInfo*); and the conditions for non-PS related sidelink discovery operation as defined in 5.10.1c are met:
 - 2> if the UE is configured with *discTxResources* set to *scheduled*:
 - 3> configure lower layers to transmit the sidelink discovery announcement using the assigned resources indicated by *scheduled* in *discTxResources*;
 - 2> else if the UE is configured with *discTxResources* set to *ue-Selected*:
 - 3> select an entry of the list of resource pool entries in *ue-Selected* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 1> else if the frequency used to transmit sidelink discovery announcements on is included in *discInterFreqList* within *SystemInformationBlockType19* of the serving cell/ PCell, and *discTxResourcesInterFreq* within *discResourcesNonPS* in the corresponding entry of *discInterFreqList* is set to *discTxPoolCommon* (i.e. serving cell/ PCell broadcasts pool of resources) and the conditions for non-PS related sidelink discovery operation as defined in 5.10.1c are met; or
- 1> else if *discTxPoolCommon* is included in *SystemInformationBlockType19* acquired from cell selected on the sidelink discovery announcement frequency; and the conditions for non-PS related sidelink discovery operation as defined in 5.10.1c are met:
 - 2> select an entry of the list of resource pool entries in *discTxPoolCommon* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 1> if the UE is configured with *discTxGapConfig* and requires sidelink discovery gaps to transmit sidelink discovery announcements on the concerned frequency;
 - 2> configure lower layers to transmit on the concerned frequency using the sidelink discovery gaps indicated by *discTxGapConfig*,
- 1> else:
 - 2> configure lower layers to transmit on the concerned frequency without affecting normal operation;

A UE capable of PS related sidelink discovery that is configured by upper layers to transmit PS related sidelink discovery announcements shall:

- 1> if out of coverage on the frequency used to transmit PS related sidelink discovery announcements as defined in TS 36.304 [4], clause 11.4, and the conditions for PS -related sidelink discovery operation as defined in 5.10.1b are met:
 - 2> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements; or

- 2> if the UE is selecting a sidelink relay UE/ has a selected sidelink relay UE:
 - 3> configure lower layers to transmit sidelink discovery announcements using the pool of resources that were preconfigured and in accordance with the following;
 - 4> randomly select, using a uniform distribution, an entry of *preconfigDisc* in *SL-Preconfiguration* defined in 9.3;
 - 4> using the timing of the selected SyncRef UE, or if the UE does not have a selected SyncRef UE, based on the UEs own timing;
- 1> else if the frequency used to transmit sidelink discovery announcements concerns the serving frequency (RRC_IDLE) or primary frequency (RRC_CONNECTED) and the conditions for PS related sidelink discovery operation as defined in 5.10.1b are met:
 - 2> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements; or
 - 2> if the UE is acting as sidelink relay UE; and if the UE is in RRC_IDLE; and if the sidelink relay UE threshold conditions as specified in 5.10.10.4 are met; or
 - 2> if the UE is acting as sidelink relay UE; and if the UE is in RRC_CONNECTED; or
 - 2> if the UE is selecting a sidelink relay UE / has a selected sidelink relay UE; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met:
 - 3> if the UE is configured with *discTxPoolPS-Dedicated*; or
 - 3> if the UE is in RRC_IDLE; and if discTxPoolPS-Common is included in SystemInformationBlockType19:
 - 4> select an entry of the list of resource pool entries and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
 - 3> else if the UE is configured with *discTxResourcesPS* set to *scheduled*:
 - 4> configure lower layers to transmit the sidelink discovery announcement using the assigned resources indicated by *scheduled* in *discTxResourcesPS*;
- 1> else if, for the frequency used to transmit sidelink discovery announcements on, the UE is configured with dedicated resources (i.e. with *discTxResourcesPS* in *discTxInterFreqInfo* within *sl-DiscConfig*); and the conditions for PS related sidelink discovery operation as defined in 5.10.1b are met:
 - 2> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements:
 - 3> if the UE is configured with *discTxResourcesPS* set to *scheduled*:
 - 4> configure lower layers to transmit the sidelink discovery announcement using the assigned resources indicated by *scheduled* in *discTxResourcesPS*;
 - 3> else if the UE is configured with *discTxResourcesPS* set to *ue-Selected*:
 - 4> select an entry of the list of resource pool entries in *ue-Selected* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 1> else if the frequency used to transmit sidelink discovery announcements on is included in *discInterFreqList* within *SystemInformationBlockType19* of the serving cell/ PCell, while *discTxResourcesInterFreq* within *discResourcesPS* in the corresponding entry of *discInterFreqList* is set to *discTxPoolCommon* (i.e. serving cell/ PCell broadcasts pool of resources) and the conditions for PS related sidelink discovery operation as defined in 5.10.1b are met:
 - 2> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements:
 - 3> select an entry of the list of resource pool entries in *discTxPoolCommon* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 1> else if *discTxPoolPS-Common* is included in *SystemInformationBlockType19* acquired from cell selected on the sidelink discovery announcement frequency; and the conditions for PS related sidelink discovery operation as defined in 5.10.1b are met:

- 2> if configured by upper layers to transmit non-relay PS related sidelink discovery announcements:
 - 3> select an entry of the list of resource pool entries in *discTxPoolPS-Common* and configure lower layers to use it to transmit the sidelink discovery announcements as specified in 5.10.6a;
- 1> if the UE is configured with *discTxGapConfig* and requires gaps to transmit sidelink discovery announcements on the concerned frequency;

2> configure lower layers to transmit on the concerned frequency using the gaps indicated by *discTxGapConfig*,

1> else:

2> configure lower layers to transmit on the concerned frequency without affecting normal operation;

5.10.6a Sidelink discovery announcement pool selection

A UE that is configured with a list of resource pool entries for sidelink discovery announcement transmission (i.e. by *SL-DiscTxPoolList*) shall:

- 1> if *poolSelection* is set to *rsrpBased*:
 - 2> select a pool from the list of pools the UE is configured with for which the RSRP measurement of the reference cell selected as defined in 5.10.6b, after applying the layer 3 filter defined by *quantityConfig* as specified in 5.5.3.2, is in-between *threshLow* and *threshHigh*;

1> else:

2> randomly select, using a uniform distribution, a pool from the list of pools the UE is configured with;

- 1> configure lower layers to transmit the sidelink discovery announcement using the selected pool of resources;
- NOTE 1: When performing resource pool selection based on RSRP, the UE uses the latest results of the available measurements used for cell reselection evaluation in RRC_IDLE/ for measurement report triggering evaluation in RRC_CONNECTED, which are performed in accordance with the performance requirements specified in TS 36.133 [16].

5.10.6b Sidelink discovery announcement reference carrier selection

A UE capable of sidelink discovery that is configured by upper layers to transmit sidelink discovery announcements shall:

- 1> for each frequency the UE is transmitting sidelink discovery announcements on, select a cell to be used as reference for synchronisation and DL measurements in accordance with the following:
 - 2> if the frequency concerns the primary frequency:
 - 3> use the PCell as reference;
 - 2> else if the frequency concerns a secondary frequency:

3> use the concerned SCell as reference;

2> else if the UE is configured with *discTxRefCarrierDedicated* for the frequency:

3> use the cell indicated by this field as reference;

- 2> else if the UE is configured with *refCarrierCommon* for the frequency:
 - 3> use the serving cell (RRC_IDLE)/ PCell (RRC_CONNECTED) as reference;

2> else:

3> use the DL frequency paired with the one used to transmit sidelink discovery announcements on as reference;

5.10.7 Sidelink synchronisation information transmission

5.10.7.1 General

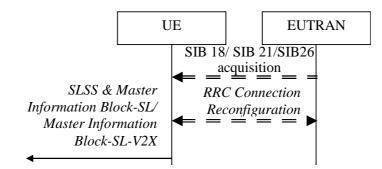


Figure 5.10.7.1-1: Synchronisation information transmission for sidelink communication or V2X sidelink communication, in (partial) coverage

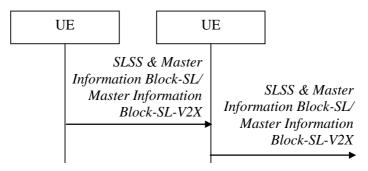


Figure 5.10.7.1-2: Synchronisation information transmission for sidelink communication or V2X sidelink communication / sidelink discovery, out of coverage

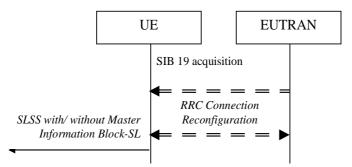


Figure 5.10.7.1-3: Synchronisation information transmission for sidelink discovery, in (partial) coverage

The purpose of this procedure is to provide synchronisation information to a UE. For sidelink discovery, the synchronisation information concerns a Sidelink Synchronisation Signal (SLSS) and, in case of PS related discovery, also timing information and some additional configuration parameters (i.e. the *MasterInformationBlock-SL* message), while for sidelink communication or V2X sidelink communication it concerns an SLSS and the *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X* message. A UE transmits synchronisation information either when E-UTRAN configures it to do so by dedicated signalling (i.e. network based), or when not configured by dedicated signalling (i.e. UE based) and E-UTRAN broadcasts (in coverage) or pre-configures a threshold (out of coverage).

The synchronisation information transmitted by the UE may be derived from information/ signals received from E-UTRAN (in coverage) or received from a UE acting as synchronisation reference for the transmitting UE or received from GNSS. In the remainder, the UE acting as synchronisation reference is referred to as SyncRef UE.

5.10.7.2 Initiation

A UE capable of SLSS transmission shall, when transmitting sidelink discovery announcements in accordance with 5.10.6 and when the following conditions are met:

- 1> if in coverage on the frequency used for sidelink discovery, as defined in TS 36.304 [4], clause 11.4:
 - 2> if in RRC_CONNECTED; and if networkControlledSyncTx is configured and set to on; or
 - 2> if networkControlledSyncTx is not configured; and syncTxThreshIC is included in SystemInformationBlockType19; and the RSRP measurement of the reference cell, selected as defined in 5.10.6b, is below the value of syncTxThreshIC:
 - 3> if the sidelink discovery announcements are not PS related; or if syncTxPeriodic is not included:
 - 4> transmit SLSS on the frequency used for sidelink discovery in accordance with 5.10.7.3 and TS 36.211 [21];
 - 3> else:
 - 4> transmit SLSS on the frequency used for sidelink discovery in accordance with 5.10.7.3 and TS 36.211 [21];
 - 4> transmit the *MasterInformationBlock-SL* message on the frequency used for sidelink discovery, in the same subframe as SLSS, and in accordance with 5.10.7.4;

1> else (i.e. out of coverage, PS):

- 2> if syncTxThreshOoC is included in the preconfigured sidelink parameters (i.e. SL-Preconfiguration defined in 9.3); and the UE has not selected SyncRef UE or the S-RSRP measurement result of the selected SyncRef UE is below the value of syncTxThreshOoC:
 - 3> transmit SLSS on the frequency used for sidelink discovery in accordance with 5.10.7.3 and TS 36.211 [21];
 - 3> transmit the *MasterInformationBlock-SL* message on the frequency used for sidelink discovery, in the same subframe as SLSS, and in accordance with 5.10.7.4;

A UE capable of sidelink communication that is configured by upper layers to transmit sidelink communication shall, irrespective of whether or not it has data to transmit:

- 1> if the conditions for sidelink communication operation as defined in 5.10.1a are met:
 - 2> if in RRC_CONNECTED; and if *networkControlledSyncTx* is configured and set to *on*:
 - 3> transmit SLSS in accordance with 5.10.7.3 and TS 36.211 [21];
 - 3> transmit the *MasterInformationBlock-SL* message, in the same subframe as SLSS, and in accordance with 5.10.7.4;

A UE shall, when transmitting sidelink communication in accordance with 5.10.4 and when the following conditions are met:

- 1> if in coverage on the frequency used for sidelink communication, as defined in TS 36.304 [4], clause 11.4:
 - 2> if the UE is in RRC_CONNECTED; and networkControlledSyncTx is not configured; and syncTxThreshIC is included in SystemInformationBlockType18; and the RSRP measurement of the cell chosen for sidelink communication transmission is below the value of syncTxThreshIC; or
 - 2> if the UE is in RRC_IDLE; and syncTxThreshIC is included in SystemInformationBlockType18; and the RSRP measurement of the cell chosen for sidelink communication transmission is below the value of syncTxThreshIC:
 - 3> transmit SLSS in accordance with 5.10.7.3 and TS 36.211 [21];
 - 3> transmit the *MasterInformationBlock-SL* message, in the same subframe as SLSS, and in accordance with 5.10.7.4;

1> else (i.e. out of coverage):

- 2> if syncTxThreshOoC is included in the preconfigured sidelink parameters (i.e. SL-Preconfiguration defined in 9.3); and the UE has no selected SyncRef UE or the S-RSRP measurement result of the selected SyncRef UE is below the value of syncTxThreshOoC:
 - 3> transmit SLSS in accordance with 5.10.7.3 and TS 36.211 [21];
 - 3> transmit the *MasterInformationBlock-SL* message, in the same subframe as SLSS, and in accordance with 5.10.7.4;

A UE capable of V2X sidelink communication and SLSS/PSBCH transmission shall, when transmitting non-P2X related V2X sidelink communication in accordance with 5.10.13, and if the conditions for V2X sidelink communication operation as defined in 5.10.1d are met and when the following conditions are met:

- 1> if in coverage on the frequency used for V2X sidelink communication, as defined in TS 36.304 [4], clause 11.4; and has selected GNSS or the cell as synchronization reference as defined in 5.10.13.3; or
- 1> if out of coverage on the frequency used for V2X sidelink communication, as defined in TS 36.304 [4], clause 11.4, and the frequency used to transmit V2X sidelink communication is included in v2x-InterFreqInfoList in RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 of the serving cell/ PCell; and has selected GNSS or the cell as synchronization reference as defined in 5.10.13.3:
 - 2> if syncFreqList is not included in RRCConnectionReconfiguration nor in SystemInformationBlockType26; or
 - 2> if syncFreqList is included in RRCConnectionReconfiguration or in SystemInformationBlockType26; and if none of the frequency(ies) selected as specified in TS 36.321 [6] is included in the syncFreqList or the concerned frequency is selected as the synchronisation carrier frequency in accordance with 5.10.8a; or
 - 2> if syncFreqList and slss-TxMultiFreq are included in RRCConnectionReconfiguration or in SystemInformationBlockType26; and if the UE has selected a frequency other than the concerned frequency as the synchronisation carrier frequency; and if slss-TxDisabled corresponding to the concerned frequency is not configured in RRCConnectionReconfiguration; and if the concerned frequency has been selected for V2X sidelink communication transmission as specified in TS 36.321 [6] and is included in syncFreqList; and if UE is capable of SLSS/PSBCH transmission on the concerned frequency:
 - 3> if in RRC_CONNECTED; and if networkControlledSyncTx is configured and set to on; or
 - 3> if *networkControlledSyncTx* is not configured; and for the concerned frequency *syncTxThreshIC* is configured; and the RSRP measurement of the reference cell, selected as defined in 5.10.13.3, for V2X sidelink communication transmission is below the value of *syncTxThreshIC*:
 - 4> transmit SLSS on the frequency used for V2X sidelink communication in accordance with 5.10.7.3 and TS 36.211 [21];
 - 4> transmit the *MasterInformationBlock-SL-V2X* message on the frequency used for V2X sidelink communication, in the same subframe as SLSS, and in accordance with 5.10.7.4;

1> else:

- 2> for the frequency used for V2X sidelink communication, if syncOffsetIndicators is included in SL-V2X-Preconfiguration:
 - 3> If syncFreqList is not included in SL-V2X-Preconfiguration; or
 - 3> if *syncFreqList* is included in *SL-V2X-Preconfiguration*, and if none of the frequency(ies) selected as specified in TS 36.321 [6] is included in the *syncFreqList* or the concerned frequency is selected as the synchronisation carrier frequency in accordance with 5.10.8a; or
 - 3> if syncFreqList and slss-TxMultiFreq are included in SL-V2X-Preconfiguration, and if the UE has selected a frequency other than the concerned frequency as the synchronisation carrier frequency; and if slss-TxDisabled corresponding to the concerned frequency is not configured in SL-V2X-Preconfiguration; and if the concerned frequency has been selected for V2X sidelink communication transmission as specified in TS 36.321 [6] and included in syncFreqList; and if the UE is capable of SLSS/PSBCH transmission on the frequency:

- 4> if syncTxThreshOoC is included in SL-V2X-Preconfiguration; and the UE is not directly synchronized to GNSS, and the UE has no selected SyncRef UE or the S-RSRP measurement result of the selected SyncRef UE is below the value of syncTxThreshOoC; or
- 4> if the UE selects GNSS as the synchronization reference source:
 - 5> transmit SLSS in accordance with 5.10.7.3 and TS 36.211 [21];
 - 5> transmit the *MasterInformationBlock-SL-V2X* message, in the same subframe as SLSS, and in accordance with 5.10.7.4;
- NOTE 1: In the case of limited transmission capabilities on multiple carrier frequencies, when the UE is configured with *syncFreqList*, whether to transmit SLSS/PSBCH on a frequency, which is selected for V2X sidelink communication transmission as specified in TS 36.321 [6] and is other than the synchronisation carrier frequency, is up to UE implementation.

5.10.7.3 Transmission of SLSS

The UE shall select the SLSSID and the subframe in which to transmit SLSS as follows:

- 1> if triggered by sidelink discovery announcement and in coverage on the frequency used for sidelink discovery, as defined in TS 36.304 [4], clause 11.4:
 - 2> select the SLSSID included in the entry of *discSyncConfig* included in the received *SystemInformationBlockType19*, that includes *txParameters*;
 - 2> use *syncOffsetIndicator* corresponding to the selected SLSSID;
 - 2> for each pool used for the transmission of discovery announcements (each corresponding to the selected SLSSID):
 - 3> if a subframe indicated by *syncOffsetIndicator* corresponds to the first subframe of the discovery transmission pool;
 - 4> if *discTxGapConfig* is configured and includes the concerned subframe; or the subframe is not used for regular uplink transmission:
 - 5> select the concerned subframe;
 - 3> else
 - 4> if *discTxGapConfig* is configured and includes the concerned subframe; or the subframe is not used for regular uplink transmission:
 - 5> select the subframe indicated by *syncOffsetIndicator* that precedes and which, in time domain, is nearest to the first subframe of the discovery transmission pool;
 - 3> if the sidelink discovery announcements concern PS; and if syncTxPeriodic is included:
 - 4> additionally select each subframe that periodically occurs 40 subframes after the selected subframe;
- 1> if triggered by sidelink communication and in coverage on the frequency used for sidelink communication, as defined in TS 36.304 [4], clause 11.4:
 - 2> select the SLSSID included in the entry of *commSyncConfig* that is included in the received *SystemInformationBlockType18* and includes *txParameters*;
 - 2> use *syncOffsetIndicator* corresponding to the selected SLSSID;
 - 2> if in RRC_CONNECTED; and if *networkControlledSyncTx* is configured and set to *on*:
 - 3> select the subframe(s) indicated by syncOffsetIndicator;
 - 2> else (when transmitting communication):

- 3> select the subframe(s) indicated by *syncOffsetIndicator* within the SC period in which the UE intends to transmit sidelink control information or data;
- 1> if triggered by V2X sidelink communication and in coverage on the frequency used for V2X sidelink communication, as defined in TS 36.304 [4], clause 11.4; or
- 1> if triggered by V2X sidelink communication, and out of coverage on the frequency used for V2X sidelink communication, and the concerned frequency is included in v2x-InterFreqInfoList in RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 of the serving cell/ PCell;
 - 2> if the UE has selected GNSS as synchronization reference in accordance with 5.10.8.2:
 - 3> select SLSSID 0;
 - 3> use *syncOffsetIndicator* included in the entry of *v2x-SyncConfig* corresponding to the concerned frequency in *v2x-InterFreqInfoList* or within *SystemInformationBlockType21*, that includes *txParameters* and *gnss-Sync*;
 - 3> select the subframe(s) indicated by syncOffsetIndicator;
 - 2> if the UE has selected a cell as synchronization reference in accordance with 5.10.8.2:
 - 3> select the SLSSID included in the entry of v2x-SyncConfig configured for the concerned frequency in v2x-InterFreqInfoList or within SystemInformationBlockType21, that includes txParameters and does not include gnss-Sync;
 - 3> use syncOffsetIndicator corresponding to the selected SLSSID;
 - 3> select the subframe(s) indicated by syncOffsetIndicator;

1> else if triggered by V2X sidelink communication and the UE has GNSS as the synchronization reference:

- 2> select SLSSID 0;
- 2> if *syncOffsetIndicator3* is configured for the frequency used for V2X sidelink communication in *SL-V2X*-*Preconfiguration*:
 - 3> select the subframe(s) indicated by *syncOffsetIndicator3*;

2> else:

3> select the subframe(s) indicated by *syncOffsetIndicator1*;

1> else:

- 2> select the synchronisation reference UE (i.e. SyncRef UE) as defined in 5.10.8;
- 2> if the UE has a selected SyncRef UE and *inCoverage* in the *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X* message received from this UE is set to *TRUE*; or
- 2> if the UE has a selected SyncRef UE and *inCoverage* in the *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X* message received from this UE is set to *FALSE* while the SLSS from this UE is part of the set defined for out of coverage, see TS 36.211 [21]:
 - 3> select the same SLSSID as the SLSSID of the selected SyncRef UE;
 - 3> select the subframe in which to transmit the SLSS according to the syncOffsetIndicator1 or syncOffsetIndicator2 included in the preconfigured sidelink parameters (i.e. preconfigSync in SL-Preconfiguration or v2x-CommPreconfigSync in SL-V2X-Preconfiguration defined in 9.3) corresponding to the concerned frequency, such that the subframe timing is different from the SLSS of the selected SyncRef UE;
- 2> else if the UE has a selected SyncRef UE and the SLSS from this UE was transmitted on the subframe indicated by syncOffsetIndicator3 that is included in the syncOffsetIndicators in SL-V2X-Preconfiguration, and is corresponding to the frequency used for V2X sidelink communication:

3> select SLSSID 169;

- 3> select the subframe(s) indicated by *syncOffsetIndicator2*;
- 2> else if the UE has a selected SyncRef UE:
 - 3> select the SLSSID from the set defined for out of coverage having an index that is 168 more than the index of the SLSSID of the selected SyncRef UE, see TS 36.211 [21];
 - 3> select the subframe in which to transmit the SLSS according to syncOffsetIndicator1 or syncOffsetIndicator2 included in the preconfigured sidelink parameters (i.e. preconfigSync in SL-Preconfiguration or v2x-CommPreconfigSync in SL-V2X-Preconfiguration defined in 9.3), such that the subframe timing is different from the SLSS of the selected SyncRef UE;
- 2> else (i.e. no SyncRef UE selected):
 - 3> if triggered by V2X sidelink communication, randomly select, using a uniform distribution, an SLSSID from the set of sequences defined for out of coverage except SLSSID 168 and 169, see TS 36.211 [21];
 - 3> else, randomly select, using a uniform distribution, an SLSSID from the set of sequences defined for out of coverage, see TS 36.211 [21];
 - 3> select the subframe in which to transmit the SLSS according to the syncOffsetIndicator1 or syncOffsetIndicator2 (arbitrary selection between these) included in the preconfigured sidelink parameters (i.e. preconfigSync in SL-Preconfiguration or v2x-CommPreconfigSync in SL-V2X-Preconfiguration defined in 9.3);

5.10.7.4 Transmission of *MasterInformationBlock-SL* or *MasterInformationBlock-SL-*V2X message

The UE shall set the contents of the *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X* message as follows:

- 1> if in coverage on the frequency used for the sidelink operation that triggered this procedure as defined in TS 36.304 [4], clause 11.4:
 - 2> set *inCoverage* to *TRUE*;
 - 2> set *sl-Bandwidth* to the value of *ul-Bandwidth* as included in the received *SystemInformationBlockType2* of the cell chosen for the concerned sidelink operation;
 - 2> if *tdd-Config* is included in the received *SystemInformationBlockType1*:
 - 3> set subframeAssignmentSL to the value representing the same meaning as of subframeAssignment that is included in tdd-Config in the received SystemInformationBlockType1;

2> else:

3> set *subframeAssignmentSL* to *none*;

2> if triggered by sidelink communication; and if *syncInfoReserved* is included in an entry of *commSyncConfig* from the received *SystemInformationBlockType18*:

3> set reserved to the value of syncInfoReserved in the received SystemInformationBlockType18;

- 2> if triggered by sidelink discovery; and if syncInfoReserved is included in an entry of discSyncConfig from the received SystemInformationBlockType19:
 - 3> set reserved to the value of syncInfoReserved in the received SystemInformationBlockType19;
- 2> if triggered by V2X sidelink communication; and if *syncInfoReserved* is included in an entry of *v2x-SyncConfig* from the received *SystemInformationBlockType21* or *SystemInformationBlockType26*:
 - 3> set reserved to the value of syncInfoReserved in the received SystemInformationBlockType21 or SystemInformationBlockType26;

2> else:

3> set all bits in *reserved* to 0;

1> else if out of coverage on the frequency used for V2X sidelink communication as defined in TS 36.304 [4], clause 11.4; and the concerned frequency is included in v2x-InterFreqInfoList in RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 of the serving cell/ PCell:

2> set *inCoverage* to *TRUE*;

- 2> set *sl-Bandwidth* to the value of the corresponding field included in *v2x-InterFreqInfoList*;
- 2> set subframeAssignmentSL and reserved to the value of the corresponding field included in the preconfigured sidelink parameters (i.e. v2x-CommPreconfigGeneral in SL-V2X-Preconfiguration defined in 9.3);
- 1> else if out of coverage on the frequency used for V2X sidelink communication as defined in TS 36.304 [4], clause 11.4; and the UE selects GNSS timing as the synchronization reference source and *syncOffsetIndicator3* is not included in *SL-V2X-Preconfiguration*:
 - 2> set inCoverage to TRUE;
 - 2> set *sl-Bandwidth*, *subframeAssignmentSL* and *reserved* to the value of the corresponding field included in the preconfigured sidelink parameters (i.e. v2x-CommPreconfigGeneral in SL-V2X-Preconfiguration defined in 9.3);
- 1> else if the UE has a selected SyncRef UE (as defined in 5.10.8) and if the SyncRef UE is selected on the concern frequency:

2> set inCoverage to FALSE;

2> set *sl-Bandwidth*, *subframeAssignmentSL* and *reserved* to the value of the corresponding field included in the received *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X*;

1> else:

- 2> set *inCoverage* to *FALSE*;
- 2> set sl-Bandwidth, subframeAssignmentSL and reserved to the value of the corresponding field included in the preconfigured sidelink parameters (i.e. preconfigGeneral in SL-Preconfiguration or v2x-CommPreconfigGeneral in SL-V2X-Preconfiguration defined in 9.3);
- 1> set *directFrameNumber* and *directSubframeNumber* according to the subframe used to transmit the SLSS, as specified in 5.10.7.3;
- 1> submit the *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X* message to lower layers for transmission upon which the procedure ends;

5.10.7.5 Void

5.10.8 Sidelink synchronisation reference

5.10.8.1 General

The purpose of this procedure is to select a synchronisation reference and used a.o. when transmitting sidelink communication, V2X sidelink communication, sidelink discovery or synchronisation information.

5.10.8.2 Selection and reselection of synchronisation reference

The UE shall:

1> if triggered by V2X sidelink communication, and in coverage on the frequency for V2X sidelink communication; or

- 1> if triggered by V2X sidelink communication, and out of coverage on the frequency for V2X sidelink communication, and the frequency used to transmit V2X sidelink communication is included in v2x-InterFreqInfoList in RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 of the serving cell/ PCell:
 - 2> If syncFreqList is not included in RRCConnectionReconfiguration nor in SystemInformationBlockType26; or
 - 2> If syncFreqList is included in RRCConnectionReconfiguration or in SystemInformationBlockType26, and none of the frequency(ies) selected as specified in TS 36.321 [6] is included in the syncFreqList; or
 - 2> If *syncFreqList* is included in *RRCConnectionReconfiguration* or in *SystemInformationBlockType26*, and no synchronisation carrier frequency is selected as specified in 5.10.8a:
 - 3> if *typeTxSync* is configured for the concerned frequency and set to *enb*:
 - 4> select a cell as the synchronization reference source as defined in 5.10.13.3;
 - 3> else if *typeTxSync* for the concerned frequency is not configured or is set to *gnss*, and GNSS is reliable in accordance with TS 36.101 [42] and TS 36.133 [16]:
 - 4> select GNSS as the synchronization reference source;
 - 3> else (i.e., there is no GNSS which is reliable in accordance with TS 36.101 [42] and TS 36.133 [16]):
 - 4> search SLSSID=0 on the concerned frequency to detect candidate SLSS, in accordance with TS 36.133 [16];
 - 4> when evaluating the detected SLSS, apply layer 3 filtering as specified in 5.5.3.2 using the preconfigured *filterCoefficient* as defined in 9.3, before using the S-RSRP measurement results;
 - 4> if the S-RSRP of the SyncRef UE identified by the detected SLSS exceeds the minimum requirement defined in TS 36.133 [16]:

5> select the SyncRef UE;

4> else (i.e., no SLSSID=0 detected):

5> select a cell as the synchronization reference source as defined in 5.10.13.3;

- 2> If *syncFreqList* is included in *RRCConnectionReconfiguration* or in *SystemInformationBlockType26*, and the UE has selected a synchronisation carrier frequency as specified in 5.10.8a:
 - 3> consider the synchornisation reference source (i.e. eNB, GNSS or SyncRef UE) that is selected on the synchronisation carrier frequency as the synchronization reference;
- 1> else, if triggered by V2X sidelink communication, and out of coverage on the frequency for V2X sidelink communication, and for the frequency used for V2X sidelink communication, if *syncPriority* in *SL-V2X-Preconfiguration* is set to *gnss* and GNSS is reliable in accordance with TS 36.101 [42] and TS 36.133 [16]:
 - 2> select GNSS as the synchronization reference source;
- 1> else, for the frequency used for sidelink communication, V2X sidelink communication or sidelink discovery, if out of coverage on that frequency as defined in TS 36.304 [4], clause 11.4:
 - 2> if triggered by sidelink communication or sidelink discovery; or
 - 2> if triggered by V2X sidelink communication, and syncFreqList is not included in SL-V2X-Preconfiguration; or
 - 2> If triggered by V2X sidelink communication, and *syncFreqList* is included in *SL-V2X-Preconfiguration*, and none of the frequency(ies) selected as specified in TS 36.321 [6] is included in the *syncFreqList*; or
 - 2> If triggered by V2X sidelink communication, and *syncFreqList* is included in *SL-V2X-Preconfiguration*, and no synchronisation carrier frequency is selected as specified in 5.10.8a:
 - 3> perform a full search (i.e. covering all subframes and all possible SLSSIDs) to detect candidate SLSS, in accordance with TS 36.133 [16]

- 3> when evaluating the one or more detected SLSSIDs, apply layer 3 filtering as specified in 5.5.3.2 using the preconfigured *filterCoefficient* as defined in 9.3, before using the S-RSRP measurement results;
- 3> if the UE has selected a SyncRef UE:
 - 4> if the S-RSRP of the strongest candidate SyncRef UE exceeds the minimum requirement TS 36.133 [16] by syncRefMinHyst and the strongest candidate SyncRef UE belongs to the same priority group as the current SyncRef UE and the S-RSRP of the strongest candidate SyncRef UE exceeds the S-RSRP of the current SyncRef UE by syncRefDiffHyst; or
 - 4> if the S-RSRP of the candidate SyncRef UE exceeds the minimum requirement TS 36.133 [16] by *syncRefMinHyst* and the candidate SyncRef UE belongs to a higher priority group than the current SyncRef UE; or
 - 4> if GNSS becomes reliable in accordance with TS 36.101 [42] and TS 36.133 [16], and GNSS belongs to a higher priority group than the current SyncRef UE; or
 - 4> if the S-RSRP of the current SyncRef UE is less than the minimum requirement defined in TS 36.133 [16]:

5> consider no SyncRef UE to be selected;

- 3> if the UE has selected GNSS as the synchronization reference for V2X sidelink communication:
 - 4> if the S-RSRP of the candidate SyncRef UE exceeds the minimum requirement defined in TS 36.133
 [16] by *syncRefMinHyst* and the candidate SyncRef UE belongs to a higher priority group than GNSS; or
 - 4> if GNSS becomes not reliable in accordance with TS 36.101 [42] and TS 36.133 [16]:

5> consider GNSS not to be selected;

- 3> if the UE has not selected a SyncRef UE and has not selected GNSS as synchronization reference source:
 - 4> if not concerning V2X sidelink communication, and if the UE detects one or more SLSSIDs for which the S-RSRP exceeds the minimum requirement defined in TS 36.133 [16] by *syncRefMinHyst* and for which the UE received the corresponding *MasterInformationBlock-SL* message (candidate SyncRef UEs), select a SyncRef UE according to the following priority group order:
 - 5> UEs of which *inCoverage*, included in the *MasterInformationBlock-SL* message received from this UE, is set to *TRUE*, starting with the UE with the highest S-RSRP result (priority group 1);
 - 5> UEs of which SLSSID is part of the set defined for in coverage, starting with the UE with the highest S-RSRP result (priority group 2);
 - 5> Other UEs, starting with the UE with the highest S-RSRP result (priority group 3);
 - 4> for V2X sidelink communication, if the UE detects one or more SLSSIDs for which the S-RSRP exceeds the minimum requirement defined in TS 36.133 [16] by *syncRefMinHyst* and for which the UE received the corresponding *MasterInformationBlock-SL-V2X* message (candidate SyncRef UEs), or if the UE detects GNSS that is reliable in accordance with TS 36.101 [42] and TS 36.133 [16], select a synchronization reference according to the following priority group order:
 - 5> if *syncPriority* corresponding to the concerned frequency in *SL-V2X-Preconfiguration* is set to *enb*:
 - 6> UEs of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE*, starting with the UE with the highest S-RSRP result (priority group 1);
 - 6> UE of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE*, starting with the UE with the highest S-RSRP result (priority group 2);
 - 6> GNSS that is reliable in accordance with TS 36.101 [42] and TS 36.133 [16] (priority group 3);

- 6> UEs of which SLSSID is 0, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE*, or of which SLSSID is 0 and SLSS is transmitted on subframes indicated by *syncOffsetIndicator3*, starting with the UE with the highest S-RSRP result (priority group 4);
- 6> UEs of which SLSSID is 0 and is not transmitted on subframes indicated by syncOffsetIndicator3, and inCoverage, included in the MasterInformationBlock-SL-V2X message received from this UE, is set to FALSE, starting with the UE with the highest S-RSRP result (priority group 5);
- 6> UEs of which SLSSID is 169, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE*, starting with the UE with the highest S-RSRP result (priority group 5);
- 6> Other UEs, starting with the UE with the highest S-RSRP result (priority group 6);
- 5> if *syncPriority* corresponding to the concerned frequency in *SL-V2X-Preconfiguration* is set to *gnss:*
 - 6> GNSS that is reliable in accordance with TS 36.101 [42] and TS 36.133 [16] (priority group 1);
 - 6> UEs of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE*, starting with the UE with the highest S-RSRP result (priority group 2);
 - 6> UEs of which SLSSID is 0, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE*, or of which SLSSID is 0 and SLSS is transmitted on subframes indicated by *syncOffsetIndicator3*, starting with the UE with the highest S-RSRP result (priority group 2);
 - 6> UE of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE*, starting with the UE with the highest S-RSRP result (priority group 3);
 - 6> UEs of which SLSSID is 0 and is not transmitted on subframes indicated by syncOffsetIndicator3, and inCoverage, included in the MasterInformationBlock-SL-V2X message received from this UE, is set to FALSE, starting with the UE with the highest S-RSRP result (priority group 3);
 - 6> UEs of which SLSSID is 169, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE*, starting with the UE with the highest S-RSRP result (priority group 3);
 - 6> Other UEs, starting with the UE with the highest S-RSRP result (priority group 4);
- 2> If triggered by V2X sidelink communication, and *syncFreqList* is included in *SL-V2X-Preconfiguration*, and the UE has selected a synchronisation carrier frequency as specified in 5.10.8a;
 - 3> consider the synchornization reference source (i.e. eNB, GNSS or SyncRef UE) that selected on the synchronisation carrier frequency as the synchronization reference;

5.10.8a Selection and reselection of synchronisation carrier frequency

For the frequency(ies) which are in coverage for the UE as defined in TS 36.304 [4], clause 11.4 and which have been selected for V2X sidelink communication as specified in TS 36.321 [6], and/or for the frequency(ies) which are out of coverage for the UE and included in *v2x-InterFreqInfoList* within *RRCConnectionReconfiguration* or *SystemInformationBlockType21* or *SystemInformationBlockType26* of the serving cell/ PCell and which have been selected for V2X sidelink communication as specified in TS 36.321 [6], the UE capable of V2X sidelink communication carrier frequency selection shall:

1> If *syncFreqList* is included in RRCConnectionReconfiguration or in *SystemInformationBlockType26*, and includes at least one of the concerned frequency(ies):

2> if no synchronisation carrier frequency is selected:

- 3> If *typeTxSync* is configured for the concerned frequency(ies) and set to *enb*; or
- 3> if *typeTxSync* for the concerned frequency(ies) is not configured or is set to *gnss*, and GNSS is reliable in accordance with TS 36.101 [42] and TS 36.133 [16]:
 - 4> select one frequency from the concerned frequency(ies) which are included in *syncFreqList* as the synchronisation carrier frequency.
- 3> else (i.e., there is no GNSS which is reliable in accordance with TS 36.101 [42] and TS 36.133 [16]):
 - 4> select the synchronisation reference source(s) on the concerned frequency(ies) which are included in syncFreqList according to 5.10.8.2:
 - 4> if SyncRef UE(s) with SLSSID=0 is detected on at least one frequency from the concerned frequency(ies):
 - 5> select one frequency from the concerned frequency(ies) with the SyncRef UE(s) with SLSSID=0 detected as the synchronisation carrier frequency;
 - 4> else (i.e., no SLSSID=0 detected and UE selects a cell as the synchronisation reference source):
 - 5> select one frequency from the concerned frequencies which are included in *syncFreqList* as the synchronisation carrier frequency;
- 2> else (i.e. the synchronisation carrier frequency is selected):
 - 3> If the UE selects GNSS as the synchronisation reference source, and GNSS is unreliable in accordance with TS 36.101 [42] and TS 36.133 [16]; or
 - 3> If the UE selects a cell as the synchronisation reference source, and the cell cannot fulfil the S criterion in accordance with TS 36.304 [4]; or
 - 3> If the UE selects a SyncRef UE and the S-RSRP of the current SyncRef UE is less than the minimum requirement defined in TS 36.133 [16]; or
 - 3> If the synchronisation carrier frequency is not selected for V2X sidelink communication as specified in TS 36.321 [6]:
 - 4> consider no synchronisation carrier frequency is selected;

For the frequency(ies) which are out of coverage for the UE and not included in *v2x-InterFreqInfoList* within *RRCConnectionReconfiguration* nor *SystemInformationBlockType21* nor *SystemInformationBlockType26* of the serving cell/ PCell and which have been selected for V2X sidelink carrier communication as specified in TS 36.321 [6], the UE capable of V2X sidelink communication and selection of synchronisation carrier frequency selection shall:

- 1> If *syncFreqList* is included in *SL-V2X-Preconfiguration*, and at least one of the concerned frequency(ies) is included in *syncFreqList*:
 - 2> if no synchronisation carrier frequency is selected:
 - 3> if *syncPriority* in *SL-V2X-Preconfiguration* is set to gnss and GNSS is reliable in accordance with TS 36.101 [42] and TS 36.133 [16]:
 - 4> select one frequency from the concerned frequency(ies) which are included in *syncFreqList* as the synchronisation carrier frequency.

3> else:

- 4> select the synchronisation reference source(s) on the concerned frequency(ies) which are included in SyncFreqList according to 5.10.8.2;
- 4> select the frequency with the highest synchronisation reference source priority as the synchronisation carrier frequency, according to the following priority gourp order:
 - 5> if *syncPriority* corresponding to the concerned frequency(ies) in *SL-V2X-Preconfiguration* is set to *enb*:

- 6> the frequency(ies) with SyncRef UE of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE* (priority group 1);
- 6> the frequency(ies) with SyncRef UE of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE* (priority group 2);
- 6> the frequency(ies) using GNSS as synchronisation reference source (priority group 3);
- 6> the frequency(ies) with SyncRef UE of which SLSSID is 0, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE*, or of which SLSSID is 0 and SLSS is transmitted on subframes indicated by *syncOffsetIndicator3* (priority group 4);
- 6> the frequency(ies) with SyncRef UE of which SLSSID is 0 and is not transmitted on subframes indicated by syncOffsetIndicator3, and inCoverage, included in the MasterInformationBlock-SL-V2X message received from this UE, is set to FALSE (priority group 5);
- 6> the frequency(ies) with SyncRef UE of which SLSSID is 169, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE* (priority group 5);
- 6> the frequency(ies) with other SyncRef UE (priority group 6);
- 5> if *syncPriority* corresponding to the concerned frequency(ies) in *SL-V2X-Preconfiguration* is set to *gnss*:
 - 6> the frequency(ies) with SyncRef UE of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE* (priority group 1);
 - 6> the frequency(ies) with SyncRef UE of which SLSSID is 0, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *TRUE*, or of which SLSSID is 0 and SLSS is transmitted on subframes indicated by *syncOffsetIndicator3* (priority group 1);
 - 6> the frequency(ies) with SyncRef UE of which SLSSID is part of the set defined for in coverage, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE* (priority group 2);
 - 6> the frequency(ies) with SyncRef UE of which SLSSID is 0 and is not transmitted on subframes indicated by syncOffsetIndicator3, and inCoverage, included in the MasterInformationBlock-SL-V2X message received from this UE, is set to FALSE (priority group 2);
 - 6> the frequency(ies) with SyncRef UE of which SLSSID is 169, and *inCoverage*, included in the *MasterInformationBlock-SL-V2X* message received from this UE, is set to *FALSE* (priority group 2);
 - 6> the frequency(ies) with other SyncRef UE (priority group 3);
- 2> else (i.e. the synchronisation carrier frequency is selected):
 - 3> If the UE selects GNSS as the synchronisation reference source, and GNSS is unreliable in accordance with TS 36.101 [42] and TS 36.133 [16]; or
 - 3> If the UE selects a SyncRef UE and the S-RSRP of the current SyncRef UE is less than the minimum requirement defined in TS 36.133 [16]; or
 - 3> If the synchronisation carrier frequency is not selected for V2X sidelink communication as specified in TS 36.321 [6]:
 - 4> consider no synchronisation carrier frequency is selected;

- NOTE 1: If more than one selected carrier frequencies satisfy the condition as the synchronisation carrier frequency for V2X sidelink communication, how to select one synchronisation carrier frequency is up to UE implementation.
- NOTE 2: All concerned carrier frequency(ies) have the same typeTxSync and syncPriority configured.

5.10.9 Sidelink common control information

5.10.9.1 General

The sidelink common control information is carried by a single message, the *MasterInformationBlock-SL* (MIB-SL) message for sidelink discovery and sidelink communication or the *MasterInformationBlock-SL-V2X* (MIB-SL-V2X) message for V2X sidelink communication. The MIB-SL or MIB-SL-V2X includes timing information as well as some configuration parameters and is transmitted via SL-BCH.

The MIB-SL for sidelink discovery and sidelink communication uses a fixed schedule with a periodicity of 40 ms without repetitions. In particular, the MIB-SL is scheduled in subframes indicated by *syncOffsetIndicator-r12* i.e. for which $(10*DFN + subframe number) \mod 40 = syncOffsetIndicator-r12$.

The MIB-SL-V2X for V2X sidelink communication uses a fixed schedule with a periodicity of 160 ms without repetitions. In particular, the MIB-SL-V2X is scheduled in subframes indicated by *SL-OffsetIndicatorSync* i.e. for which (10*DFN + subframe number) mod 160 = *SL-OffsetIndicatorSync*.

The sidelink common control information may change at any transmission i.e. neither a modification period nor a change notification mechanism is used.

A UE configured to receive or transmit sidelink communication or PS related sidelink discovery shall:

1> if the UE has a selected SyncRef UE, as specified in 5.10.8.2:

2> ensure having a valid version of the *MasterInformationBlock-SL* message of that SyncRefUE;

A UE configured to receive or transmit V2X sidelink communication shall:

1> if the UE has a selected SyncRef UE, as specified in 5.10.8.2:

2> ensure having a valid version of the *MasterInformationBlock-SL-V2X* message of that SyncRefUE;

5.10.9.2 Actions related to reception of *MasterInformationBlock-SL/ MasterInformationBlock-SL-V2X* message

Upon receiving MasterInformationBlock-SL or MasterInformationBlock-SL-V2X, the UE shall:

1> apply the values of *sl-Bandwidth*, *subframeAssignmentSL*, *directFrameNumber* and *directSubframeNumber* included in the received *MasterInformationBlock-SL* or *MasterInformationBlock-SL-V2X* message;

5.10.10 Sidelink relay UE operation

5.10.10.1 General

This procedure is used by a UE supporting sidelink relay UE operation and involves evaluation of the AS-layer conditions that need to be met in order for upper layers to configure a sidelink relay UE to receive/ transmit relay related PS sidelink discovery/ relay related sidelink communication. The AS-layer conditions merely comprise of being configured with radio resources that can be used for transmission.

A UE that fulfils the criteria specified in 5.10.10.2 and 5.10.10.3 and that is configured by higher layers accordingly is acting as a sidelink relay UE.

5.10.10.2 AS-conditions for relay related sidelink communication transmission by sidelink relay UE

A UE capable of sidelink relay UE operation shall inform upper layers that it is configured with radio resources that can be used for relay related sidelink communication transmission if the following conditions are met:

1> if in RRC_CONNECTED; and if the UE is configured with *commTxResources*; and the UE is configured with *commTxAllowRelayDedicated* set to *true*;

5.10.10.3 AS-conditions for relay PS related sidelink discovery transmission by sidelink relay UE

A UE capable of sidelink relay UE operation shall inform upper layers that it is configured with radio resources that can be used for relay PS related sidelink discovery transmission if the following conditions are met:

- 1> if in RRC_IDLE; and if the UE's serving cell is suitable as defined in TS 36.304 [4]; and if SystemInformationBlockType19 includes discConfigPS including discTxPoolPS-Common and discConfigRelay; and if the sidelink relay UE threshold conditions as specified in 5.10.10.4 are met;
- 1> else if in RRC_CONNECTED; and if *discTxResourcesPS* is configured;

5.10.10.4 Sidelink relay UE threshold conditions

A UE capable of sidelink relay UE operation shall:

- 1> if the threshold conditions specified in this clause were not met:
 - 2> if neither *threshHigh* nor *threshLow* is included in *relayUE-Config* within *SystemInformationBlockType19*:

3> consider the threshold conditions to be met (entry);

- 2> else if threshHigh is not included in relayUE-Config within SystemInformationBlockType19; or the RSRP measurement of the PCell, or the cell on which the UE camps, is below threshHigh by hystMax (also included within relayUE-Config); and
- 2> if *threshLow* is not included in *relayUE-Config* within *SystemInformationBlockType19*; or the RSRP measurement of the PCell, or the cell on which the UE camps, is above *threshLow* by *hystMin* (also included within *relayUE-Config*):

3> consider the threshold conditions to be met (entry);

1> else:

- 2> if *threshHigh* is included in *relayUE-Config* within *SystemInformationBlockType19*; and the RSRP measurement of the PCell, or the cell on which the UE camps, is above *threshHigh* (also included within *relayUE-Config*); or
- 2> if threshLow is included in relayUE-Config within SystemInformationBlockType19; and the RSRP measurement of the PCell, or the cell on which the UE camps, is below threshLow (also included within relayUE-Config);

3> consider the threshold conditions not to be met (leave);

5.10.11 Sidelink remote UE operation

5.10.11.1 General

This procedure is used by a UE supporting sidelink remote UE operation and involves evaluation of the AS-layer conditions that need to be met in order for upper layers to configure a sidelink remote UE to receive/ transmit relay related sidelink PS discovery/ relay related sidelink communication. The AS-layer conditions merely comprise of being configured with radio resources that can be used for transmission, as well as whether or not having a selected sidelink relay UE.

5.10.11.2 AS-conditions for relay related sidelink communication transmission by sidelink remote UE

A UE capable of sidelink remote UE operation shall inform upper layers whether it is configured with radio resources that can be used for relay related sidelink communication transmission if the following conditions are met:

- 1> if the UE is out of coverage; and is preconfigured with SL-Preconfiguration including discTxPoolList and preconfigRelay;
- 1> else if in RRC_IDLE; and if the UE's serving cell is suitable as defined in TS 36.304 [4]; and if SystemInformationBlockType18 includes commTxPoolNormalCommon and commTxAllowRelayCommon; and if SystemInformationBlockType19 includes discConfigRelay; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met;
- 1> else if in RRC_CONNECTED; and if the UE is configured with *commTxResources*; and the UE is configured with *commTxAllowRelayDedicated* set to *true*;

5.10.11.3 AS-conditions for relay PS related sidelink discovery transmission by sidelink remote UE

A UE capable of sidelink remote UE operation shall inform upper layers whether it is configured with radio resources that can be used for relay PS related sidelink discovery transmission if the following conditions are met:

- 1> if the UE is out of coverage; and is preconfigured with *SL-Preconfiguration* including *discTxPoolList* and *preconfigRelay*;
- 1> else if in RRC_IDLE; and if the UE's serving cell is suitable as defined in TS 36.304 [4]; and if SystemInformationBlockType19 includes discConfigPS including discTxPoolPS-Common and discConfigRelay; and if the sidelink remote UE threshold conditions as specified in 5.10.11.5 are met;
- 1> else if in RRC_CONNECTED; and if *discTxResourcesPS* is configured;

5.10.11.4 Selection and reselection of sidelink relay UE

A UE capable of sidelink remote UE operation that is configured by upper layers to search for a sidelink relay UE shall:

- 1> if out of coverage on the frequency used for sidelink communication, as defined in TS 36.304 [4], clause 11.4; or
- 1> if the serving frequency is used for sidelink communication and the RSRP measurement of the cell on which the UE camps (RRC_IDLE)/ the PCell (RRC_CONNECTED) is below *threshHigh* within *remoteUE-Config* :
 - 2> search for candidate sidelink relay UEs, in accordance with TS 36.133 [16]
 - 2> when evaluating the one or more detected sidelink relay UEs, apply layer 3 filtering as specified in 5.5.3.2 across measurements that concern the same ProSe Relay UE ID and using the *filterCoefficient* in *SystemInformationBlockType19* (in coverage) or the preconfigured *filterCoefficient* as defined in 9.3(out of coverage), before using the SD-RSRP measurement results;

NOTE 1: The details of the interaction with upper layers are up to UE implementation.

- 2> if the UE does not have a selected sidelink relay UE:
 - 3> select a candidate sidelink relay UE which SD-RSRP exceeds q-RxLevMin included in either reselectionInfoIC (in coverage) or reselectionInfoOoC (out of coverage) by minHyst;
- 2> else if SD-RSRP of the currently selected sidelink relay UE is below *q-RxLevMin* included in either *reselectionInfoIC* (in coverage) or *reselectionInfoOoC* (out of coverage); orif upper layers indicate not to use the currently selected sidelink relay: (i.e. sidelink relay UE reselection):
 - 3> select a candidate sidelink relay UE which SD-RSRP exceeds *q*-*RxLevMin* included in either *reselectionInfoIC* (in coverage) or *reselectionInfoOoC* (out of coverage) by *minHyst*;
- 2> else if the UE did not detect any candidate sidelink relay UE which SD-RSRP exceeds *q*-*RxLevMin* included in either *reselectionInfoIC* (in coverage) or *reselectionInfoOoC* (out of coverage) by *minHyst*:

- 3> consider no sidelink relay UE to be selected;
- NOTE 2: The UE may perform sidelink relay UE reselection in a manner resulting in selection of the sidelink relay UE, amongst all candidate sidelink relay UEs meeting higher layer criteria, that has the best radio link quality. Further details, including interaction with upper layers, are up to UE implementation.

5.10.11.5 Sidelink remote UE threshold conditions

A UE capable of sidelink remote UE operation shall:

- 1> if the threshold conditions specified in this clause were not met:
 - 2> if threshHigh is not included in remoteUE-Config within SystemInformationBlockType19; or
 - 2> if threshHigh is included in remoteUE-Config within SystemInformationBlockType19; and the RSRP measurement of the PCell, or the cell on which the UE camps, is below threshHigh by hystMax (also included within remoteUE-Config):

3> consider the threshold conditions to be met (entry);

1> else:

2> if threshHigh is included in remoteUE-Config within SystemInformationBlockType19; and the RSRP measurement of the PCell, or the cell on which the UE camps, is above threshHigh (also included within remoteUE-Config):

3> consider the threshold conditions not to be met (leave);

5.10.12 V2X sidelink communication monitoring

A UE capable of V2X sidelink communication that is configured by upper layers to receive V2X sidelink communication shall:

- 1> if the conditions for sidelink operation as defined in 5.10.1d are met:
 - 2> if in coverage on the frequency used for V2X sidelink communication, as defined in TS 36.304 [4], clause 11.4:
 - 3> if the frequency used to receive V2X sidelink communication is included in v2x-InterFreqInfoList within RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 of the serving cell/Pcell, and v2x-CommRxPool is included in SL-V2X-InterFreqUE-Config within v2x-UE-ConfigList in the entry of v2x-InterFreqInfoList for the concerned frequency:
 - 4> configure lower layers to monitor sidelink control information and the corresponding data using the pool of resources indicated in v2x-CommRxPool;

3> else:

- 4> if the cell chosen for V2X sidelink communication reception broadcasts SystemInformationBlockType21 including v2x-CommRxPool in sl-V2X-ConfigCommon or,
- 4> if the UE is configured with v2x-CommRxPool included in mobilityControlInfoV2X in RRCConnectionReconfiguration:
 - 5> configure lower layers to monitor sidelink control information and the corresponding data using the pool of resources indicated in *v2x-CommRxPool*;
- 2> else (i.e. out of coverage on the frequency used for V2X sidelink communication, as defined in TS 36.304 [4], clause 11.4):
 - 3> if the frequency used to receive V2X sidelink communication is included in v2x-InterFreqInfoList within RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26 of the serving cell/PCell, and v2x-CommRxPool is included in SL-V2X-

InterFreqUE-Config within v2x-UE-ConfigList in the entry of v2x-InterFreqInfoList for the concerned frequency:

4> configure lower layers to monitor sidelink control information and the corresponding data using the pool of resources indicated in *v2x-CommRxPool*;

3> else:

4> configure lower layers to monitor sidelink control information and the corresponding data using the pool of resources that were preconfigured (i.e. v2x-CommRxPoolList in SL-V2X-Preconfiguration defined in 9.3);

5.10.13 V2X sidelink communication transmission

5.10.13.1 Transmission of V2X sidelink communication

A UE capable of V2X sidelink communication that is configured by upper layers to transmit V2X sidelink communication and has related data to be transmitted shall:

- 1> if the conditions for sidelink operation as defined in 5.10.1d are met:
 - 2> if in coverage on the frequency used for V2X sidelink communication as defined in TS 36.304 [4], clause 11.4; or
 - 2> if the frequency used to transmit V2X sidelink communication is included in v2x-InterFreqInfoList in RRCConnectionReconfiguration or in v2x-InterFreqInfoList within SystemInformationBlockType21 or SystemInformationBlockType26:
 - 3> if the UE is in RRC_CONNECTED and uses the PCell or the frequency included in v2x-InterFreqInfoList in RRCConnectionReconfiguration for V2X sidelink communication:
 - 4> if the UE is configured, by the current PCell with *commTxResources* set to *scheduled*:
 - 5> if T310 or T311 is running; and if the PCell at which the UE detected physical layer problems or radio link failure broadcasts SystemInformationBlockType21 including v2x-CommTxPoolExceptional in sl-V2X-ConfigCommon, or v2x-CommTxPoolExceptional is included in v2x-InterFreqInfoList for the concerned frequency in SystemInformationBlockType21 or SystemInformationBlockType26 or RRCConnectionReconfiguration; or
 - 5> if T301 is running and the cell on which the UE initiated connection re-establishment broadcasts SystemInformationBlockType21 including v2x-CommTxPoolExceptional in sl-V2X-ConfigCommon, or v2x-CommTxPoolExceptional is included in v2x-InterFreqInfoList for the concerned frequency in SystemInformationBlockType21 or SystemInformationBlockType26; or
 - 5> if T304 is running and the UE is configured with v2x-CommTxPoolExceptional included in mobilityControlInfoV2X in RRCConnectionReconfiguration or in v2x-InterFreqInfoList for the concerned frequency in RRCConnectionReconfiguration:
 - 6> configure lower layers to transmit the sidelink control information and the corresponding data based on random selection using the pool of resources indicated by v2x-CommTxPoolExceptional as defined in TS 36.321 [6];
 - 5> else:
 - 6> configure lower layers to request E-UTRAN to assign transmission resources for V2X sidelink communication;
 - 4> else if the UE is configured with v2x-CommTxPoolNormalDedicated or v2x-CommTxPoolNormal or p2x-CommTxPoolNormal in the entry of v2x-InterFreqInfoList for the concerned frequency in sl-V2X-ConfigDedicated in RRCConnectionReconfiguration:
 - 5> if the UE is configured to transmit non-P2X related V2X sidelink communication and a result of sensing on the resources configured in *v2x-CommTxPoolNormalDedicated* or *v2x-*

CommTxPoolNormal in the entry of *v2x-InterFreqInfoList* for the concerned frequency in *RRCConnectionReconfiguration* is not available in accordance with TS 36.213 [23]; or

- 5> if the UE is configured to transmit P2X related V2X sidelink communication and selects to use partial sensing according to 5.10.13.1a, and a result of partial sensing on the resources configured in v2x-CommTxPoolNormalDedicated or p2x-CommTxPoolNormal in the entry of v2x-InterFreqInfoList for the concerned frequency in RRCConnectionReconfiguration is not available in accordance with TS 36.213 [23]:
 - 6> if v2x-CommTxPoolExceptional is included in mobilityControlInfoV2X in RRCConnectionReconfiguration (i.e., handover case); or
 - 6> if v2x-CommTxPoolExceptional is included in the entry of v2x-InterFreqInfoList for the concerned frequency in RRCConnectionReconfiguration; or
 - 6> if the PCell broadcasts SystemInformationBlockType21 including v2x-CommTxPoolExceptional in sl-V2X-ConfigCommon or v2x-CommTxPoolExceptional in v2x-InterFreqInfoList for the concerned frequency or broadcasts SystemInformationBlockType26 including v2x-CommTxPoolExceptional in v2x-InterFreqInfoList for the concerned frequency:
 - 7> configure lower layers to transmit the sidelink control information and the corresponding data based on random selection using the pool of resources indicated by v2x-CommTxPoolExceptional as defined in TS 36.321 [6];
- 5> else if the UE is configured to transmit P2X related V2X sidelink communication:

6> select a resource pool according to 5.10.13.2;

6> perform P2X related V2X sidelink communication according to 5.10.13.1a;

- 5> else if the UE is configured to transmit non-P2X related V2X sidelink communication:
 - 6> configure lower layers to transmit the sidelink control information and the corresponding data based on sensing (as defined in TS 36.321 [6] and TS 36.213 [23]) using one of the resource pools indicated by v2x-commTxPoolNormalDedicated or v2x-CommTxPoolNormal in the entry of v2x-InterFreqInfoList for the concerned frequency, which is selected according to 5.10.13.2;

3> else:

- 4> if the cell chosen for V2X sidelink communication transmission broadcasts SystemInformationBlockType21 or SystemInformationBlockType26:
 - 5> if the UE is configured to transmit non-P2X related V2X sidelink communication, and if SystemInformationBlockType21 includes v2x-CommTxPoolNormalCommon or v2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency, or SystemInformationBlockType26 includes v2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency, and if a result of sensing on the resources configured in v2x-CommTxPoolNormalCommon or v2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency is available in accordance with TS 36.213 [23]:
 - 6> configure lower layers to transmit the sidelink control information and the corresponding data based on sensing (as defined in TS 36.321 [6] and TS 36.213 [23]) using one of the resource pools indicated by v2x-CommTxPoolNormalCommon or v2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency, which is selected according to 5.10.13.2;
 - 5> else if the UE is configured to transmit P2X related V2X sidelink communication, and if SystemInformationBlockType21 includes p2x-CommTxPoolNormalCommon or p2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency, or SystemInformationBlockType26 includes p2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency, and if the UE selects to use random selection according to 5.10.13.1a, or selects to use partial sensing according to 5.10.13.1a and a result of partial sensing on the resources configured in p2x-CommTxPoolNormalCommon or p2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency is available in accordance with TS 36.213 [23]:

- 6> select a resource pool from p2x-CommTxPoolNormalCommon or p2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency according to 5.10.13.2, but ignoring zoneConfig in SystemInformationBlockType21 or SystemInformationBlockType26;
- 6> perform P2X related V2X sidelink communication according to 5.10.13.1a;
- 5> else if SystemInformationBlockType21 includes v2x-CommTxPoolExceptional in sl-V2X-ConfigCommon or v2x-CommTxPoolExceptional in v2x-InterFreqInfoList for the concerned frequency, or SystemInformationBlockType26 includes v2x-CommTxPoolExceptional in v2x-InterFreqInfoList for the concerned frequency:
 - 6> from the moment the UE initiates connection establishment until receiving an *RRCConnectionReconfiguration* including *sl-V2X-ConfigDedicated*, or until receiving an *RRCConnectionRelease* or an *RRCConnectionReject*; or
 - 6> if the UE is in RRC_IDLE and a result of sensing on the resources configured in v2x-CommTxPoolNormalCommon or v2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency in Systeminformationblocktype21 or v2x-CommTxPoolNormal in v2x-InterFreqInfoList for the concerned frequency in Systeminformationblocktype26 is not available in accordance with TS 36.213 [23]; or
 - 6> if the UE is in RRC_IDLE and UE selects to use partial sensing according to 5.10.13.1a and a result of partial sensing on the resources configured in *p2x-CommTxPoolNormalCommon* or *p2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* for the concerned frequency in *Systeminformationblocktype21* or *v2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* for the concerned frequency in *Systeminformationblocktype21* or *v2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* for the sources of the concerned frequency in *Systeminformationblocktype21* or *v2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* for the sources of the
 - 7> configure lower layers to transmit the sidelink control information and the corresponding data based on random selection (as defined in TS 36.321 [6]) using the pool of resources indicated in v2x-CommTxPoolExceptional;

2> else:

3> configure lower layers to transmit the sidelink control information and the corresponding data based on sensing (as defined in TS 36.321 [6] and TS 36.213 [23]) using one of the resource pools indicated by v2x-CommTxPoolList in SL-V2X-Preconfiguration in case of non-P2X related V2X sidelink communication, which is selected according to 5.10.13.2, or using one of the resource pools indicated by p2x-CommTxPoolList in SL-V2X-Preconfiguration in case of P2X related V2X sidelink communication, which is selected according to 5.10.13.2, and in accordance with the timing of the selected reference as defined in 5.10.8;

The UE capable of non-P2X related V2X sidelink communication that is configured by upper layers to transmit V2X sidelink communication shall perform sensing on all pools of resources which may be used for transmission of the sidelink control information and the corresponding data. The pools of resources are indicated by *SL-V2X-Preconfiguration*, *v2x-CommTxPoolNormalCommon*, *v2x-CommTxPoolNormalDedicated* in *sl-V2X-ConfigDedicated*, or *v2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* for the concerned frequency, as configured above.

5.10.13.1a Transmission of P2X related V2X sidelink communication

A UE configured to transmit P2X related V2X sidelink communication shall:

- 1> if *partialSensing* is included and *randomSelection* is not included in *resourceSelectionConfigP2X* of the pool selected; or
- 1> if both *partialSensing* and *randomSelection* are included in *resourceSelectionConfigP2X* of the pool selected, and the UE selects to use partial sensing:
 - 2> configure lower layers to transmit the sidelink control information and the corresponding data based on partial sensing (as defined in TS 36.321 [6] and TS 36.213 [23]) using the selected resource pool, if the UE supports partial sensing;
- 1> if *partialSensing* is not included and *randomSelection* is included in *resourceSelectionConfigP2X* of the pool selected.

- 2> configure lower layers to transmit the sidelink control information and the corresponding data based on random selection (as defined in TS 36.321 [6] and TS 36.213 [23]) using the selected resource pool;
- 1> if both *partialSensing* and *randomSelection* is included in *resourceSelectionConfigP2X* of the pool selected, and the UE selects to use random selection:
 - 2> configure lower layers to transmit the sidelink control information and the corresponding data based on random selection using the selected resource pool and indicates to lower layers that transmissions of multiple MAC PDUs are allowed (as defined in TS 36.321 [6] and TS 36.213 [23]).
- NOTE: If both *partialSensing* and *randomSelection* is included in *resourceSelectionConfigP2X* of the pool selected, the selection between partial sensing and random selection is left to UE implementation.

5.10.13.2 V2X sidelink communication transmission pool selection

For a frequency used for V2X sidelink communication, if *zoneConfig* is not ignored as specified in 5.10.13.1, the UE configured by upper layers for V2X sidelink communication shall only use the pool which corresponds to geographical coordinates of the UE, if *zoneConfig* is included in *SystemInformationBlockType21* or *SystemInformationBlockType26* of the serving cell (RRC_IDLE)/ PCell (RRC_CONNECTED) or in *RRCConnectionReconfiguration* for the concerned frequency, and the UE is configured to use resource pools provided by RRC signalling for the concerned frequency; or if *zoneConfig* is included in *SL-V2X-Preconfiguration* for the frequency, according to 5.10.13.1. The UE shall only use the pool which is associated with the synchronization reference source selected in accordance with 5.10.8.2.

- 1> if the UE is configured to transmit on p2x-CommTxPoolNormalCommon or on p2x-CommTxPoolNormal in v2x-InterFreqInfoList in SystemInformationBlockType21 or on p2x-CommTxPoolNormal in v2x-InterFreqInfoList in SystemInformationBlockType26 according to 5.10.13.1; or
- 1> if the UE is configured to transmit on *p2x-CommTxPoolList-r14* in *SL-V2X-Preconfiguration* according to 5.10.13.1; or
- 1> if *zoneConfig* is not included in *SystemInformationBlockType21* and the UE is configured to transmit on v2x-*CommTxPoolNormalCommon* or v2x-*CommTxPoolNormalDedicated*; or
- 1> if zoneConfig is included in SystemInformationBlockType21 and the UE is configured to transmit on v2x-CommTxPoolNormalDedicated for P2X related V2X sidelink communication and zoneID is not included in v2x-CommTxPoolNormalDedicated; or
- 1> if zoneConfig is not included in the entry of v2x-InterFreqInfoList for the concerned frequency and the UE is configured to transmit on v2x-CommTxPoolNormal in v2x-InterFreqInfoList or p2x-CommTxPoolNormal in v2x-InterFreqInfoList in RRCConnectionReconfiguration; or
- 1> if *zoneConfig* is included in the entry of *v2x-InterFreqInfoList* for the concerned frequency and the UE is configured to transmit on *p2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* in *RRCConnectionReconfiguration* and *zoneID* is not included in *p2x-CommTxPoolNormal*; or
- 1> if *zoneConfig* is not included in *SL-V2X-Preconfiguration* for the concerned frequency and the UE is configured to transmit on *v2x-CommTxPoolList* in *SL-V2X-Preconfiguration* for the concerned frequency:
 - 2> select a pool associated with the synchronization reference source selected in accordance with 5.10.8.2;
- NOTE 0: If multiple pools are associated with the selected synchronization reference source, it is up to UE implementation which resource pool is selected for V2X sidelink communication transmission.
- 1> if zoneConfig is included in SystemInformationBlockType21 and the UE is configured to transmit on v2x-CommTxPoolNormalCommon or v2x-CommTxPoolNormalDedicated for non-P2X related V2X sidelink communication; or
- 1> if zoneConfig is included in SystemInformationBlockType21 and the UE is configured to transmit on v2x-CommTxPoolNormalDedicated for P2X related V2X sidelink communication and zoneID is included in v2x-CommTxPoolNormalDedicated; or
- 1> if *zoneConfig* is included in the entry of *v2x-InterFreqInfoList* for the concerned frequency and if the UE is configured to transmit on *v2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* or is configured to transmit on *p2x-*

- *CommTxPoolNormal* in v2x-InterFreqInfoList in RRCConnectionReconfiguration and zoneID is included in p2x-CommTxPoolNormal; or
- 1> if *zoneConfig* is included in *SL-V2X-Preconfiguration* for the concerned frequency and the UE is configured to transmit on *v2x-CommTxPoolList* in *SL-V2X-Preconfiguration* for the concerned frequency:
 - 2> select the pool configured with *zoneID* equal to the zone identity determined below and associated with the synchronization reference source selected in accordance with 5.10.8.2;

The UE shall determine an identity of the zone (i.e. Zone_id) in which it is located using the following formulae, if *zoneConfig* is included in *SystemInformationBlockType21* or *SystemInformationBlockType26* or in *SL-V2X-Preconfiguration*:

 x_1 = Floor (x / L) Mod Nx; y_1 = Floor (y / W) Mod Ny; Zone_id = $y_1 * Nx + x_1$.

The parameters in the formulae are defined as follows:

L is the value of *zoneLength* included in *zoneConfig* in *SystemInformationBlockType21* or *SystemInformationBlockType26* or in *SL-V2X-Preconfiguration;*

W is the value of *zoneWidth* included in *zoneConfig* in *SystemInformationBlockType21* or *SystemInformationBlockType26* or in *SL-V2X-Preconfiguration*;

Nx is the value of *zoneIdLongiMod* included in *zoneConfig* in *SystemInformationBlockType21* or *SystemInformationBlockType26* or in *SL-V2X-Preconfiguration;*

Ny is the value of *zoneIdLatiMod* included in *zoneConfig* in *SystemInformationBlockType21* or *SystemInformationBlockType26* or in *SL-V2X-Preconfiguration*;

x is the geodesic distance in longitude between UE's current location and geographical coordinates (0, 0) according to WGS84 model [80] and it is expressed in meters;

y is the geodesic distance in latitude between UE's current location and geographical coordinates (0, 0) according to WGS84 model [80] and it is expressed in meters.

The UE shall select a pool of resources which includes a *zoneID* equals to the Zone_id calculated according to above mentioned formulae and indicated by *v2x-CommTxPoolNormalDedicated*, *v2x-CommTxPoolNormalCommon*, *v2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* or *p2x-CommTxPoolNormal* in *v2x-InterFreqInfoList* in *RRCConnectionReconfiguration*, or *v2x-CommTxPoolList* according to 5.10.13.1.

NOTE 1: The UE uses its latest geographical coordinates to perform resource pool selection.

NOTE 2: If geographical coordinates are not available and zone specific TX resource pools are configured for the concerned frequency, it is up to UE implementation which resource pool is selected for V2X sidelink communication transmission.

5.10.13.3 V2X sidelink communication transmission reference cell selection

A UE capable of V2X sidelink communication that is configured by upper layers to transmit V2X sidelink communication shall:

- 1> for each frequency used to transmit V2X sidelink communication, select a cell to be used as reference for synchronisation and DL measurements in accordance with the following:
 - 2> if the frequency concerns the primary frequency:
 - 3> use the PCell (RRC_CONNECTED) or the serving cell (RRC_IDLE) as reference;
 - 2> else if the frequency concerns a secondary frequency:

3> use the concerned SCell as reference;

- 2> else if the UE is in coverage of the concerned frequency:
 - 3> use the DL frequency paired with the one used to transmit V2X sidelink communication as reference;
- 2> else (i.e., out of coverage on the concerned frequency):
 - 3> use the PCell (RRC_CONNECTED) or the serving cell (RRC_IDLE) as reference, if needed;

5.10.14 DFN derivation from GNSS

When the UE selects GNSS as the synchronization reference source, the DFN used for V2X sidelink communication is derived from the current UTC time, by the following formulae:

DFN= Floor (0.1*(Tcurrent -Tref-offsetDFN)) mod 1024

SubframeNumber= Floor (Tcurrent –Tref–offsetDFN) mod 10

Where:

Tcurrent is the current UTC time that obtained from GNSS. This value is expressed in milliseconds;

Tref is the reference UTC time 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Thursday, December 31, 1899 and Friday, January 1, 1900). This value is expressed in milliseconds;

OffsetDFN is the value offsetDFN if configured, otherwise it is zero. This value is expressed in milliseconds.

NOTE: In case of leap second change event, how V2X UE obtains the scheduled time of leap second change to adjust *Tcurrent* correspondingly is left to UE implementation. How V2X UE handles the sudden discontinuity of DFN is left to UE implementation.

6 Protocol data units, formats and parameters (tabular & ASN.1)

6.1 General

The contents of each RRC message is specified in sub-clause 6.2 using ASN.1 to specify the message syntax and using tables when needed to provide further detailed information about the fields specified in the message syntax. The syntax of the information elements that are defined as stand-alone abstract types is further specified in a similar manner in sub-clause 6.3.

The need for fields to be present in a message or an abstract type, i.e., the ASN.1 fields that are specified as OPTIONAL in the abstract notation (ASN.1), is specified by means of comment text tags attached to the OPTIONAL statement in the abstract syntax. All comment text tags are available for use in the downlink direction only. The meaning of each tag is specified in table 6.1-1.

Abbreviation	Meaning
Cond conditionTag	Conditionally present
(Used in downlink only)	A field for which the need is specified by means of conditions. For each <i>conditionTag</i> , the need is specified in a tabular form following the ASN.1 segment. In case, according to the conditions, a field is not present, the UE takes no action and where applicable shall continue to use the existing value (and/ or the associated functionality) unless explicitly stated otherwise (e.g. in the conditional presence table or in the description of the field itself).
Need OP (Used in downlink only)	Optionally present A field that is optional to signal. For downlink messages, the UE is not required to take any special action on absence of the field beyond what is specified in the procedural text or the field description table following the ASN.1 segment. The UE behaviour on absence should be captured either in the procedural text or in the field description.

Abbreviation	Meaning
Need ON	Optionally present, No action
(Used in downlink only)	A field that is optional to signal. If the message is received by the UE, and in case the field is absent, the UE takes no action and where applicable shall continue to use the existing value (and/ or the associated functionality).
Need OR	Optionally present, Release
(Used in downlink only)	A field that is optional to signal. If the message is received by the UE, and in case the field is absent, the UE shall discontinue/ stop using/ delete any existing value (and/ or the associated functionality).

Any field with Need ON in system information shall be interpreted as Need OR.

Need codes may not be specified for a parent extension field/ extension group, used in downlink, which includes one or more child extension fields. Upon absence of such a parent extension field/ extension group, the UE shall:

- For each individual child extension field, including extensions that are mandatory to include in the optional group, act in accordance with the need code that is defined for the extension;
- Apply this behaviour not only for child extension fields included directly within the optional parent extension field/ extension group, but also for extension fields defined at further nesting levels as long as for none of the fields in-between the concerned extension field and the parent extension field a need code is specified;
- NOTE 1: The above applies for groups of non critical extensions using double brackets (referred to as extension groups), as well as non-critical extensions at the end of a message or at the end of a structure contained in a BIT STRING or OCTET STRING (referred to as parent extension fields).

Need codes, conditions and ASN.1 defaults specified for a particular (child) field only apply in case the (parent) field including the particular field is present. This rule does not apply for optional parent extension fields/ extension groups without need codes,

- NOTE 2: The previous rule implies that E-UTRAN has to include such a parent extension field to release a child field that is either:
 - Optional with need OR, or
 - Conditional while the UE releases the child field when absent.

The handling of need codes as specified in the previous is illustrated by means of an example, as shown in the following ASN.1.

-	- /example/ ASN1START			
R }	RCMessage-r8-IEs ::= field1 field2 nonCriticalExtension	SEQUENCE { InformationElement1, InformationElement2 RRCMessage-v8a0-IEs	OPTIONAL, OPTIONAL	Need ON
R }	RCMessage-v8a0-IEs ::= field3 nonCriticalExtension	SEQUENCE { InformationElement3 RRCMessage-v940-IEs	OPTIONAL, OPTIONAL	Need ON
R }	RCMessage-v940-IEs ::= field4 nonCriticalExtension	SEQUENCE { InformationElement4 SEQUENCE {}	OPTIONAL, OPTIONAL	Need OR
1	nformationElement1 ::= field11 field12 , [[field13 field14]]	SEQUENCE { InformationElement11 InformationElement12 InformationElement13 InformationElement14	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need OR Need OR Need ON
I	nformationElement2 ::=	SEQUENCE {		

```
field21 InformationElement11 OPTIONAL, -- Need OR
...
}
-- ASN1STOP
```

The handling of need codes as specified in the previous implies that:

- if *field2* in *RRCMessage-r8-IEs* is absent, the UE does not modify *field21*;
- if *field2* in *RRCMessage-r8-IEs* is present but does not include *field21*, the UE releases *field21*;
- if the extension group containing *field13* is absent, the UE releases *field13* and does not modify *field14*;
- if *nonCriticalExtension* defined by IE *RRCMessage-v8a0-IEs* is absent, the UE does not modify *field3* and releases *field4*;

In the ASN.1 of this specification, the first bit of a bit string refers to the leftmost bit, unless stated otherwise.

6.2 RRC messages

NOTE: The messages included in this clause reflect the current status of the discussions. Additional messages may be included at a later stage.

6.2.1 General message structure

EUTRA-RRC-Definitions

This ASN.1 segment is the start of the E-UTRA RRC PDU definitions.

-- ASN1START

```
EUTRA-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=
```

BEGIN

-- ASN1STOP

BCCH-BCH-Message

The *BCCH-BCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via BCH on the BCCH logical channel.

```
-- ASN1START

BCCH-BCH-Message ::= SEQUENCE {

    message BCCH-BCH-MessageType

}

BCCH-BCH-MessageType ::= MasterInformationBlock

-- ASN1STOP
```

BCCH-BCH-Message-MBMS

The *BCCH-BCH-Message-MBMS* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via BCH on the BCCH logical channel in an MBMS-dedicated cell.

```
-- ASN1START
BCCH-BCH-Message-MBMS::= SEQUENCE {
message BCCH-BCH-MessageType-MBMS-r14
}
```

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BCCH-BCH-MessageType-MBMS-r14 ::=

MasterInformationBlock-MBMS-r14

-- ASN1STOP

BCCH-DL-SCH-Message

The *BCCH-DL-SCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via DL-SCH on the BCCH logical channel.

```
-- ASN1START
BCCH-DL-SCH-Message ::= SEQUENCE {
                         BCCH-DL-SCH-MessageType
   message
}
BCCH-DL-SCH-MessageType ::= CHOICE {
   c1
                           CHOICE {
       systemInformation
                                              SystemInformation,
       systemInformationBlockType1
                                              SystemInformationBlockType1
    },
   messageClassExtension SEQUENCE {}
}
-- ASN1STOP
```

BCCH-DL-SCH-Message-BR

The *BCCH-DL-SCH-Message-BR* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via DL-SCH on the BR-BCCH logical channel.

```
-- ASN1START
BCCH-DL-SCH-Message-BR ::= SEQUENCE {
                          BCCH-DL-SCH-MessageType-BR-r13
   message
}
BCCH-DL-SCH-MessageType-BR-r13 ::= CHOICE {
                           CHOICE {
   с1
       systemInformation-BR-r13
                                              SystemInformation-BR-r13,
       systemInformationBlockType1-BR-r13
                                               SystemInformationBlockType1-BR-r13
   },
   messageClassExtension SEQUENCE { }
}
-- ASN1STOP
```

BCCH-DL-SCH-Message-MBMS

The *BCCH-DL-SCH-Message-MBMS* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via DL-SCH on the BCCH logical channel in an MBMS-dedicated cell.

```
-- ASN1START
BCCH-DL-SCH-Message-MBMS ::= SEQUENCE {
                               BCCH-DL-SCH-MessageType-MBMS-r14
   message
}
BCCH-DL-SCH-MessageType-MBMS-r14 ::= CHOICE {
                                     CHOICE {
   c1
       systemInformation-MBMS-r14
                                                   SystemInformation-MBMS-r14,
       systemInformationBlockType1-MBMS-r14
                                                  SystemInformationBlockType1-MBMS-r14
    },
    messageClassExtension SEQUENCE { }
}
-- ASN1STOP
```

MCCH-Message

The *MCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the MCCH logical channel.

-- ASN1START

```
MCCH-Message ::= SEQUENCE {
   message
                         MCCH-MessageType
}
MCCH-MessageType ::= CHOICE {
                             CHOICE {
   c1
       mbsfnAreaConfiguration-r9
                                    MBSFNAreaConfiguration-r9
   }.
                           CHOICE {
   later
                                     CHOICE {
     с2
         mbmsCountingRequest-r10
                                     MBMSCountingRequest-r10
       },
       messageClassExtension SEQUENCE { }
   }
}
-- ASN1STOP
```

PCCH-Message

The *PCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the PCCH logical channel.

```
-- ASN1START
PCCH-Message ::= SEQUENCE {
    message PCCH-MessageType
}
PCCH-MessageType ::= CHOICE {
    c1 CHOICE {
        paging Paging
    },
    messageClassExtension SEQUENCE {}
}
-- ASN1STOP
```

- DL-CCCH-Message

The *DL-CCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the downlink CCCH logical channel.

```
-- ASN1START
DL-CCCH-Message ::= SEQUENCE {
    message
                              DL-CCCH-MessageType
}
DL-CCCH-MessageType ::= CHOICE {
        CHOICE {
rrcConnectionReestablishment
rrcConnectionReestablishmentReject
rrcConnectionReject
RRCConnectionReject,
RRCConnectionSetup

                              CHOICE {
    c1
                                                    RRCConnectionReestablishmentReject,
                                                    RRCConnectionSetup
        rrcConnectionSetup
    },
    messageClassExtension CHOICE {
                                 CHOICE {
        c2
            rrcEarlyDataComplete-r15
                                                    RRCEarlyDataComplete-r15,
             spare3 NULL, spare2 NULL, spare1 NULL
         },
        messageClassExtensionFuture-r15
                                                    SEQUENCE { }
    }
}
```

-- ASN1STOP

DL-DCCH-Message

The *DL-DCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE or from the E-UTRAN to the RN on the downlink DCCH logical channel.

```
-- ASN1START
DL-DCCH-Message ::= SEQUENCE {
      message
                                         DL-DCCH-MessageType
}
DL-DCCH-MessageType ::= CHOICE {
                                          CHOICE {
     c1

    csfbParametersResponseCDMA2000
    CSFBParametersResponseCDMA2000,

    dlInformationTransfer
    DLInformationTransfer,

    handoverFromEUTRAPreparationRequest
    HandoverFromEUTRAPreparationRequest,

            mobilityFromEUTRACommand
                                                                         MobilityFromEUTRACommand,
            mobilityFromEUTRACommandMobilityFromEUTRACommand,rrcConnectionReconfigurationRRCConnectionReconfiguration,rrcConnectionReleaseRRCConnectionRelease,
            securityModeCommand
                                                                         SecurityModeCommand,
            ueCapabilityEnquiry
                                                                       UECapabilityEnquiry,
                                                                       CounterCheck,
UEInformationRequest-r9,
            counterCheck
            ActinionmationRequest-r9UEInformationRequest-r9,loggedMeasurementConfiguration-r10LoggedMeasurementConfiguration-r10,rrcConnectionResume-r13RNReconfiguration-r10,
            spare3 NULL, spare2 NULL, spare1 NULL
      },
      messageClassExtension SEQUENCE { }
}
```

```
-- ASN1STOP
```

UL-CCCH-Message

The *UL-CCCH-Message* class is the set of RRC messages that may be sent from the UE to the E-UTRAN on the uplink CCCH logical channel.

```
-- ASN1START
UL-CCCH-Message ::= SEQUENCE {
                           UL-CCCH-MessageType
   message
}
UL-CCCH-MessageType ::= CHOICE {
                          CHOICE {
   c1
       rrcConnectionReestablishmentRequest RRCConnectionReestablishmentRequest,
       rrcConnectionRequest
                                               RRCConnectionRequest
    },
    messageClassExtension CHOICE {
                            CHOICE {
       c2
           rrcConnectionResumeRequest-r13
                                               RRCConnectionResumeRequest-r13
        },
       messageClassExtensionFuture-r13 CHOICE {
                                  CHOICE {

CHOICE {

RRCEarlyDataRequest-r15,
           с3
               rrcEarlyDataRequest-r15
               spare3 NULL, spare2 NULL, spare1
                                                       NULL
           },
           messageClassExtensionFuture-r15
                                               SEQUENCE { }
        }
    }
}
-- ASN1STOP
```

UL-DCCH-Message

The *UL-DCCH-Message* class is the set of RRC messages that may be sent from the UE to the E-UTRAN or from the RN to the E-UTRAN on the uplink DCCH logical channel.

```
-- ASN1START
```

```
UL-DCCH-Message ::= SEQUENCE {
                        UL-DCCH-MessageType
    message
}
UL-DCCH-MessageType ::= CHOICE {
    c1
                                  CHOICE {
         csfbParametersRequestCDMA2000
                                                                CSFBParametersRequestCDMA2000,
         measurementReport
                                                                MeasurementReport,
                                                            RRCConnectionReconfigurationComplete,
         rrcConnectionReconfigurationComplete
          rrcConnectionReestablishmentComplete
                                                                RRCConnectionReestablishmentComplete,
         rrcConnectionSetupComplete
                                                                RRCConnectionSetupComplete,
          securityModeComplete
                                                                SecurityModeComplete,
          securityModeFailure
                                                                SecurityModeFailure,
          ueCapabilityInformation
                                                                UECapabilityInformation,
          ulHandoverPreparationTransfer
                                                                ULHandoverPreparationTransfer,
         ulInformationTransfer
                                                                ULInformationTransfer,
          counterCheckResponse
                                                                CounterCheckResponse,
          ueInformationResponse-r9
                                                                UEInformationResponse-r9,
         proximityIndication-r9
                                                                ProximityIndication-r9,
          rnReconfigurationComplete-r10
                                                                RNReconfigurationComplete-r10,
         mbmsCountingResponse-r10
                                                                MBMSCountingResponse-r10,
          interFreqRSTDMeasurementIndication-r10
                                                               InterFreqRSTDMeasurementIndication-r10
     },
     messageClassExtension CHOICE {
                                             CHOICE {
         c2
              ueAssistanceInformation-r11 UEAssistanceInformation-r11,
inDeviceCoexIndication-r11 InDeviceCoexIndication-r11,
              mbmsInterestIndication-r11
scgFailureInformation-r12
                                                          MBMSInterestIndication-r11,
                                                          SCGFailureInformation-r12,
              SidelinkUEInformation-r12SidelinkUEInformation-r12,wlanConnectionStatusReport-r13WLANConnectionStatusReport-r13,rrcConnectionResumeComplete-r13RRCConnectionResumeComplete-r13,ulInformationTransferMRDC-r15ULInformationTransferMRDC-r15,scgFailureInformationNR-r15SCGFailureInformationNR-r15,
              scgFailureInformationNR-r15 SCGFailureInformationNR
measReportAppLayer-r15 MeasReportAppLayer-r15,
failureInformation-r15 FailureInformation-r15.
                                                           FailureInformation-r15,
               failureInformation-r15
               spare5 NULL, spare4 NULL, spare3 NULL, spare2 NULL, spare1 NULL
          },
          messageClassExtensionFuture-r11 SEQUENCE {}
     }
}
```

```
-- ASN1STOP
```

SC-MCCH-Message

The *SC-MCCH-Message* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the SC-MCCH logical channel.

```
-- ASN1START
SC-MCCH-Message-r13 ::= SEQUENCE {
                            SC-MCCH-MessageType-r13
    message
}
SC-MCCH-MessageType-r13 ::= CHOICE {
    c1
                            CHOICE {
        scptmConfiguration-r13
                                                     SCPTMConfiguration-r13
    }.
    messageClassExtension CHOICE {
                                    CHOICE {
        c2
            scptmConfiguration-BR-r14
                                                     SCPTMConfiguration-BR-r14,
            spare
                                                     NULL
        }.
        messageClassExtensionFuture-r14 SEQUENCE {}
```

} -- ASN1STOP

_

6.2.2 Message definitions

CounterCheck

The *CounterCheck* message is used by the E-UTRAN to indicate the current COUNT MSB values associated to each DRB and to request the UE to compare these to its COUNT MSB values and to report the comparison results to E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

CounterCheck message

ASN1START		
<pre>CounterCheck ::= SEQUENCE rrc-TransactionIdentifier criticalExtensions c1 counterCheck-r8 spare3 NULL, spare2 NULL }, criticalExtensionsFuture } }</pre>	RRC-TransactionIdentifier, CHOICE { CHOICE { COunterCheck-r8-IEs,	
CounterCheck-r8-IEs ::= SEQUENCE { drb-CountMSB-InfoList nonCriticalExtension }	DRB-CountMSB-InfoList, CounterCheck-v8a0-IEs	OPTIONAL
<pre>CounterCheck-v8a0-IEs ::= SEQUENCE { lateNonCriticalExtension nonCriticalExtension }</pre>	OCTET STRING CounterCheck-v1530-IEs	OPTIONAL, OPTIONAL
<pre>CounterCheck-v1530-IEs ::= SEQUENCE drb-CountMSB-InfoListExt-r15 nonCriticalExtension }</pre>	{ DRB-CountMSB-InfoListExt-r15 SEQUENCE {}	OPTIONAL, Need ON OPTIONAL
DRB-CountMSB-InfoList ::= SEQUI	ENCE (SIZE (1maxDRB)) OF DRB-CountMS	B-Info
DRB-CountMSB-InfoListExt-r15 ::= 5	SEQUENCE (SIZE (1maxDRBExt-r15)) OF	DRB-CountMSB-Info
countMSB-Uplink :	DRB-Identity, INTEGER(033554431), INTEGER(033554431)	

CounterCheck field descriptions		
count-MSB-Downlink		
If configured with E-UTRA PDCP, it indicates the value of 25 MSBs from downlink COUNT associated to this DRB. If		
configured with NR PDCP, it indicates the value of 25 MSBs from RX_NEXT – 1 (specified in TS 38.323 [83])		
associated to this DRB.		
count-MSB-Uplink		
If configured with E-UTRA PDCP, it indicates the value of 25 MSBs from uplink COUNT associated to this DRB. If		
configured with NR PDCP, it indicates the value of 25 MSBs from TX_NEXT - 1 (specified in TS 38.323 [83])		
associated to this DRB.		
drb-CountMSB-InfoList		
Indicates the MSBs of the COUNT values of the DRBs.		

CounterCheckResponse

The CounterCheckResponse message is used by the UE to respond to a CounterCheck message.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

CounterCheckResponse message

-- ASN1START

<pre>CounterCheckResponse ::= rrc-TransactionIdentifier criticalExtensions counterCheckResponse-r8 criticalExtensionsFuture } }</pre>	<pre>SEQUENCE { RRC-TransactionIdentifier, CHOICE { CounterCheckResponse-r8-IEs, SEQUENCE {}</pre>	
CounterCheckResponse-r8-IEs ::= SEQ drb-CountInfoList nonCriticalExtension }	QUENCE { DRB-CountInfoList, CounterCheckResponse-v8a0-IEs	OPTIONAL
<pre>CounterCheckResponse-v8a0-IEs ::= S lateNonCriticalExtension nonCriticalExtension }</pre>	SEQUENCE { OCTET STRING CounterCheckResponse-v1530-IEs	OPTIONAL, OPTIONAL
<pre>CounterCheckResponse-v1530-IEs ::= drb-CountInfoListExt-r15 nonCriticalExtension }</pre>	SEQUENCE { DRB-CountInfoListExt-r15 SEQUENCE {}	OPTIONAL, OPTIONAL
DRB-CountInfoList ::= SEQ	QUENCE (SIZE (0maxDRB)) OF DRB-CountIr	nfo
DRB-CountInfoListExt-r15 ::= SE(QUENCE (SIZE (1maxDRBExt-r15)) OF DRB-	-CountInfo
DRB-CountInfo ::= SEQUENCE { drb-Identity count-Uplink count-Downlink }	DRB-Identity, INTEGER(04294967295), INTEGER(04294967295)	
ASN1STOP		

CounterCheckResponse field descriptions

count-Downlink If configured with E-UTRA PDCP, it indicates the value of downlink COUNT associated to this DRB. If configured with NR PDCP, it indicates the value of RX_NEXT – 1 (specified in TS 38.323 [83]) associated to this DRB. *count-Uplink* If configured with E-UTRA PDCP, it indicates the value of uplink COUNT associated to this DRB. If configured with NR PDCP, it indicates the value of TX_NEXT – 1 (specified in TS 38.323 [83]) associated to this DRB.

Indicates the COUNT values of the DRBs.

CSFBParametersRequestCDMA2000

The *CSFBParametersRequestCDMA2000* message is used by the UE to obtain the CDMA2000 1xRTT Parameters from the network. The UE needs these parameters to generate the CDMA2000 1xRTT Registration message used to register with the CDMA2000 1xRTT Network which is required to support CSFB to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

CSFBParametersRequestCDMA2000 message

-- ASN1START CSFBParametersRequestCDMA2000 ::= SEQUENCE { criticalExtensions CHOICE { csfbParametersRequestCDMA2000-r8 CSFBParametersRequestCDMA2000-r8-IEs, criticalExtensionsFuture SEOUENCE { } } } CSFBParametersRequestCDMA2000-r8-IEs ::= SEQUENCE { nonCriticalExtension CSFBParametersRequestCDMA2000-v8a0-IEs OPTIONAL } CSFBParametersRequestCDMA2000-v8a0-IEs ::= SEQUENCE { lateNonCriticalExtension OCTET STRING OPTIONAL, nonCriticalExtension SEQUENCE { } OPTIONAL }

-- ASN1STOP

CSFBParametersResponseCDMA2000

The *CSFBParametersResponseCDMA2000* message is used to provide the CDMA2000 1xRTT Parameters to the UE so the UE can register with the CDMA2000 1xRTT Network to support CSFB to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

CSFBParametersResponseCDMA2000 message

```
-- ASN1START

CSFBParametersResponseCDMA2000 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

csfbParametersResponseCDMA2000-r8 CSFBParametersResponseCDMA2000-r8-IEs,
```

```
criticalExtensionsFuture
                                                      SEQUENCE { }
    }
}
CSFBParametersResponseCDMA2000-r8-IEs ::= SEQUENCE {
    rand RAND-CDMA2000,
mobilityParameters MobilityParametersCDMA2000,
nonCriticalExtension CSFBParametersResponseCDMA2
   rand
                                            CSFBParametersResponseCDMA2000-v8a0-IEs OPTIONAL
}
CSFBParametersResponseCDMA2000-v8a0-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING
                                                                                      OPTIONAL.
    nonCriticalExtension
                                            SEQUENCE { }
                                                                                      OPTTONAL.
-- ASN1STOP
```

DLInformationTransfer

The *DLInformationTransfer* message is used for the downlink transfer of NAS, non-3GPP dedicated information or time reference information.

- NOTE: The UE may use the time reference information provided in the *timeReferenceInfo* IE for numerous purposes, possibly involving upper layers e.g. to synchronise the UE clock.
- Signalling radio bearer: SRB2 or SRB1. If only *timeReferenceInfo* is included in the message, SRB1 is used. Otherwise, SRB1 is used only if SRB2 not established yet, and if SRB2 is suspended, E-UTRAN does not send this message until SRB2 is resumed.

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: E-UTRAN to UE

DLInformationTransfer message

```
DLInformationTransfer ::=
                                 SEQUENCE {
                               RRC-TransactionIdentifier,
   rrc-TransactionIdentifier
   criticalExtensions
                                    CHOICE {
                                     CHOICE {
       c1
           dlInformationTransfer-r8
                                           DLInformationTransfer-r8-IEs,
          dlInformationTransfer-r15
                                           DLInformationTransfer-r15-IEs,
           spare2 NULL, spare1 NULL
       },
                                  SEQUENCE {}
       criticalExtensionsFuture
   }
}
DLInformationTransfer-r8-IEs ::= SEQUENCE {
                        CHOICE {
   dedicatedInfoType
                                    DedicatedInfoNAS,
       dedicatedInfoNAS
       dedicatedInfoCDMA2000-1XRTT
                                        DedicatedInfoCDMA2000.
       dedicatedInfoCDMA2000-HRPD
                                      DedicatedInfoCDMA2000
   },
   nonCriticalExtension
                                   DLInformationTransfer-v8a0-IEs
                                                                    OPTIONAL
}
DLInformationTransfer-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                    OCTET STRING
                                                                      OPTIONAL,
   nonCriticalExtension
                                    SEQUENCE { }
                                                                      OPTTONAL.
}
DLInformationTransfer-r15-IEs ::= SEQUENCE {
                          CHOICE {
   dedicatedInfoType-r15
       dedicatedInfoNAS-r15
                                       DedicatedInfoNAS,
       dedicatedInfoCDMA2000-1XRTT-r15
                                       DedicatedInfoCDMA2000,
       dedicatedInfoCDMA2000-HRPD-r15
                                        DedicatedInfoCDMA2000
                                                                      OPTIONAL,
                                                                                 -- Need ON
                                                                      OPTIONAL,
   timeReferenceInfo-r15
                                    TimeReferenceInfo-r15
                                                                                 -- Need ON
                            DLInformationTransfer-v8a0-IEs
   nonCriticalExtension
                                                                     OPTIONAL
```

}
-- ASN1STOP

FailureInformation

The *FailureInformation* message is used to provide information regarding failures detected by the UE, e.g. radio link failure for one of the RLC entities configured with PDCP duplication.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

FailureInformation message

```
-- ASN1START
FailureInformation-r15 ::=
                              SEQUENCE {
   failedLogicalChannelInfo-r15 FailedLogicalChannelInfo-r15
                                                                     OPTIONAL
    -- nonCriticalExtension is removed in this version as OPTIONAL was missing
}
FailedLogicalChannelInfo-r15 ::= SEQUENCE {
   failedLogicalChannelIdentity-r15 SEQUENCE {
       cellGroupIndication-r15
       logicalChannelIdentity-r15
                                          ENUMERATED {mn, sn},
                                          INTEGER (1..10)
                                                                     OPTIONAL,
       logicalChannelIdentityExt-r15
                                        INTEGER (32..38)
                                                                     OPTIONAL
   failureType ENUMERATED {duplication, spare3, spare2, spare1}
}
-- ASN1STOP
```

FailureInformation field descriptions

cellGroupIndication This field indicates the cell group (MCG, SCG) of the RLC entity for which the PDCP duplication failure occurred. failureType This field indicates the type of failure reported. Value duplication indicates that a radio link failure for one of the RL

This field indicates the type of failure reported. Value *duplication* indicates that a radio link failure for one of the RLC entities configured with PDCP duplication has been detected.

logicalChannelldentity, logicalChannelldentityExt

This field indicates the logical channel identity of the RLC entity for which the PDCP duplication failure occurred.

-

HandoverFromEUTRAPreparationRequest (CDMA2000)

The *HandoverFromEUTRAPreparationRequest* message is used to trigger the handover preparation procedure with a CDMA2000 RAT. This message is also used to trigger a tunneled preparation procedure with a CDMA2000 1xRTT RAT to obtain traffic channel resources for the enhanced CS fallback to CDMA2000 1xRTT, which may also involve a concurrent preparation for handover to CDMA2000 HRPD. Also, this message is used to trigger the dual Rx/Tx redirection procedure with a CDMA2000 1xRTT RAT.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

HandoverFromEUTRAPreparationRequest message

-- ASN1START

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<pre>HandoverFromEUTRAPreparationRequest rrc-TransactionIdentifier criticalExtensions c1 handoverFromEUTRAPrepara spare3 NULL, spare2 NULL },</pre>	RRC-TransactionIdentifier, CHOICE { CHOICE { tionRequest-r8 Handove	rFromEUTRAPreparation	Request-r8-IEs,
<pre>criticalExtensionsFuture } </pre>	SEQUENCE {}		
rand mobilityParameters	r8-IEs ::= SEQUENCE { CDMA2000-Type, RAND-CDMA2000 MobilityParametersCDMA2000 HandoverFromEUTRAPreparation	OPTIONAL, Cond	cdma2000-Type cdma2000-Type OPTIONAL
	v890-IEs ::= SEQUENCE { OCTET STRING HandoverFromEUTRAPreparation	OPTIONAL, nRequest-v920-IEs	OPTIONAL
		IONAL, Cond cdma nRequest-v1020-IEs	
<pre>HandoverFromEUTRAPreparationRequest- dualRxTxRedirectIndicator-r10 redirectCarrierCDMA2000-1XRTT-r1 nonCriticalExtension }</pre>	ENUMERATED { True }	,	cdma2000-1XRTT dualRxTxRedirect

```
-- ASN1STOP
```

HandoverFromEUTRAPreparationRequest field descriptions

concurrPrepCDMA2000-HRPD

Value TRUE indicates that upper layers should initiate concurrent preparation for handover to CDMA2000 HRPD in addition to preparation for enhanced CS fallback to CDMA2000 1xRTT.

dualRxTxRedirectIndicator

Value TRUE indicates that the second radio of the dual Rx/Tx UE is being redirected to CDMA2000 1xRTT, as specified in TS 23.272 [51].

redirectCarrierCDMA2000-1XRTT

Used to indicate the CDMA2000 1xRTT carrier frequency where the UE is being redirected to.

Conditional presence	Explanation
cdma2000-1XRTT	The field is optionally present, need ON, if the <i>cdma2000-Type</i> = <i>type1XRTT</i> ; otherwise it is not present.
cdma2000-Type	The field is mandatory present if the <i>cdma2000-Type</i> = <i>type1XRTT</i> ; otherwise it is not present.
dualRxTxRedirect	The field is optionally present, need ON, if <i>dualRxTxRedirectIndicator</i> is present; otherwise it is not present.

InDeviceCoexIndication

The *InDeviceCoexIndication* message is used to inform E-UTRAN about IDC problems which can not be solved by the UE itself, as well as to provide information that may assist E-UTRAN when resolving these problems.

Signalling radio bearer: SRB1

```
RLC-SAP: AM
```

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

InDeviceCoexIndication message

```
SEQUENCE {
InDeviceCoexIndication-r11 ::=
                                        CHOICE {
    criticalExtensions
            cHOICE {
        c1
                                                      InDeviceCoexIndication-r11-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                             SEQUENCE { }
    }
}
InDeviceCoexIndication-r11-IEs ::= SEQUENCE {
    eviceCoexIndication-rii-iEs ··- Sequence (
affectedCarrierFreqList-rll AffectedCarrierFreqList-rll
tdm-AssistanceInfo-rll TDM-AssistanceInfo-rll
                                                                                        OPTIONAL,
    tdm-AssistanceInfo-rll
lateNonCriticalExtension
                                                                                       OPTIONAL,
                                         OCTET STRING
                                                                                       OPTIONAL,
                                         InDeviceCoexIndication-v11d0-IEs
    nonCriticalExtension
                                                                                       OPTIONAL
}
InDeviceCoexIndication-v11d0-IEs ::= SEQUENCE {
                                         SEQUENCE {
    ul-CA-AssistanceInfo-r11
        affectedCarrierFreqCombList-r11
                                             AffectedCarrierFreqCombList-r11
                                                                                   OPTIONAL,
        victimSystemType-r11
                                             VictimSystemType-r11
                                                                                   OPTIONAL,
                                        InDeviceCoexIndication-v1310-IEs
    nonCriticalExtension
                                                                                   OPTIONAL
}
InDeviceCoexIndication-v1310-IEs ::= SEQUENCE {
affectedCarrierFreqList-v1310
affectedCarrierFreqCombList-r13
AffectedCarrierFreqCombList-r13
                                             AffectedCarrierFreqList-v1310 OPTIONAL,
InDeviceCoexIndicati
    nonCriticalExtension
                                             InDeviceCoexIndication-v1360-IEs OPTIONAL
}
                                       SEQUENCE {
InDeviceCoexIndication-v1360-IEs ::=
    hardwareSharingProblem-r13
                                             ENUMERATED {true}
                                                                                    OPTIONAL,
                                              InDeviceCoexIndication-v1530-IEs OPTIONAL
    nonCriticalExtension
}
InDeviceCoexIndication-v1530-IEs ::=
                                       SEQUENCE {
    mrdc-AssistanceInfo-r15
                                              MRDC-AssistanceInfo-r15
                                                                                   OPTIONAL,
    nonCriticalExtension
                                              SEQUENCE { }
                                                                                   OPTIONAL
}
AffectedCarrierFreqList-rll ::= SEQUENCE (SIZE (1..maxFreqIDC-rll)) OF AffectedCarrierFreq-rll
AffectedCarrierFreqList-v1310 ::= SEQUENCE (SIZE (1..maxFreqIDC-r11)) OF AffectedCarrierFreq-v1310
AffectedCarrierFreq-r11 ::= SEQUENCE {
    carrierFreq-r11
                                MeasObjectId,
    interferenceDirection-rll ENUMERATED {eutra, other, both, spare}
}
AffectedCarrierFreq-v1310 ::= SEQUENCE {
   carrierFreq-v1310
                                    MeasObjectId-v1310
                                                                                        OPTIONAL
}
AffectedCarrierFreqCombList-r11 ::= SEQUENCE (SIZE (1..maxCombIDC-r11)) OF AffectedCarrierFreqComb-
r11
AffectedCarrierFreqCombList-r13 ::= SEQUENCE (SIZE (1..maxCombIDC-r11)) OF AffectedCarrierFreqComb-
r13
```

AffectedCarrierFreqComb-r11 ::= SEQUENCE (SIZE (2..maxServCell-r10)) OF MeasObjectId AffectedCarrierFreqComb-r13 ::= SEQUENCE (SIZE (2..maxServCell-r13)) OF MeasObjectId-r13 TDM-AssistanceInfo-r11 ::= CHOICE { SEQUENCE { drx-AssistanceInfo-r11 ENUMERATED {sf40, sf64, sf80, sf128, sf160, drx-CycleLength-r11 sf256, spare2, spare1}, INTEGER (0..255) OPTIONAL, ENUMERATED {sf20, sf30, sf40, sf60, sf80, drx-Offset-r11 drx-ActiveTime-r11 sf100, spare2, spare1} idc-SubframePatternList-r11 IDC-SubframePatternList-r11, . . . } IDC-SubframePatternList-r11 ::= SEQUENCE (SIZE (1..maxSubframePatternIDC-r11)) OF IDC-SubframePattern-r11 IDC-SubframePattern-r11 ::= CHOICE { -SubframePattern-rif ... subframePatternFDD-r11 subframePatternTDD-r11 subframeConfig0-r11 subframeConfig1-5-r11 BIT STRING (SIZE (4)), CHOICE { BIT STRING (SIZE (70)), BIT STRING (SIZE (10)), BIT STRING (SIZE (60)) }, . . . } VictimSystemType-r11 ::= SEQUENCE { ENUMERATED {true} gps-r11 OPTIONAL, glonass-r11 ENUMERATED {true} OPTIONAL, ENUMERATED {true} bds-r11 OPTIONAL. galileo-r11 ENUMERATED {true} OPTIONAL, wlan-r11 ENUMERATED {true} OPTIONAL, bluetooth-r11 ENUMERATED {true} OPTIONAL } MRDC-AssistanceInfo-r15 ::= SEQUENCE { affectedCarrierFreqCombInfoListMRDC-r15 SEQUENCE (SIZE (1..maxCombIDC-r11)) OF AffectedCarrierFreqCombInfoMRDC-r15, } AffectedCarrierFreqCombInfoMRDC-r15 ::= SEQUENCE { VictimSystemType-r11, victimSystemType-r15 interferenceDirectionMRDC-r15 ENUMERATED {eutra-nr, nr, other, eutra-nr-other, nr-other, spare3, spare2, spare1}, affectedCarrierFreqCombMRDC-r15 SEQUENCE { affectedCarrierFreqCombEUTRA-r15 AffectedCarrierFreqCombNR-r15 AffectedCarrierFreqCombNR-r1 OPTIONAL, affectedCarrierFreqCombNR-r15 AffectedCarrierFreqCombNR-r15 } OPTIONAL } AffectedCarrierFreqComb-r15 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasObjectId-r13 AffectedCarrierFreqCombNR-r15 ::= SEQUENCE (SIZE (1..maxServCellNR-r15)) OF ARFCN-ValueNR-r15 -- ASN1STOP

InDeviceCoexIndication field descriptions	
ffectedCarrierFreq	
carrierFreq-v1310 is included, carrierFreq-r11 is ignored by eNB.	
ffectedCarrierFreqCombList	
idicates a list of E-UTRA carrier frequencies that are affected by IDC problems due to Inter-Modulation	
armonics from E-UTRA when configured with UL CA. affectedCarrierFreqCombList-r13 is used when n	nore than 5
erving cells are configured or affected combinations contain MeasObjectId larger than 32. If	
ffectedCarrierFreqCombList-r13 is included, affectedCarrierFreqCombList-r11 shall not be included.	
ffectedCarrierFreqCombMRDC	
idicates a set of at least one NR carrier frequency and optionally one or more E-UTRA carrier frequenc	cy that is
ffected by IDC problems due to Inter-Modulation Distortion and harmonics when configured with MR-D	C.
ffectedCarrierFreqList	
ist of E-UTRA carrier frequencies affected by IDC problems. If E-UTRAN includes affectedCarrierFreqL	<i>List-v1310</i> it
cludes the same number of entries, and listed in the same order, as in <i>affectedCarrierFreqList-r11</i> .	
rx-ActiveTime	
dicates the desired active time that the E-UTRAN is recommended to configure. Value in number of su	ubframes.
alue sf20 corresponds to 20 subframes, sf30 corresponds to 30 subframes and so on.	
rx-CycleLength	
dicates the desired DRX cycle length that the E-UTRAN is recommended to configure. Value in number	er of
ubframes. Value sf40 corresponds to 40 subframes, sf64 corresponds to 64 subframes and so on.	
rx-Offset	
dicates the desired DRX starting offset that the E-UTRAN is recommended to configure. The UE shall	set the value
f drx-Offset smaller than the value of drx-CycleLength. The starting frame and subframe satisfy the rela	
0) + subframe number] modulo (<i>drx-CycleLength</i>) = <i>drx-Offset</i> .	
ardwareSharingProblem	
dicates whether the UE has hardware sharing problems that the UE cannot solve by itself. The field is	present (i.e.
alue true), if the UE has such hardware sharing problems. Otherwise the field is absent.	
lc-SubframePatternList	
list of one or more subframe patterns indicating which HARQ process E-UTRAN is requested to absta	in from using.
alue 0 indicates that E-UTRAN is requested to abstain from using the subframe. For FDD, the radio fra	
he pattern starts (i.e. the radio frame in which the first/leftmost bit of the subframePatternFDD correspon	
ubframe #0) occurs when SFN mod 2 = 0. For TDD, the first/leftmost bit corresponds to the subframe #	
ame satisfying SFN mod x = 0, where x is the size of the bit string divided by 10. The UE shall indicate	
attern that follows HARQ time line, as specified in TS 36.213 [23], i.e, if a subframe is set to 1 in the su	
attern, also the corresponding subframes carrying the potential UL grant, as specified in TS 36.213 [23	
e UL HARQ retransmission, as specified in TS 36.213 [23], clause 8.0, and the DL/UL HARQ feedbac	
TS 36.213 [23], clauses 7.3, 8.3 and 9.1.2, shall be set to 1.	· •
nterferenceDirection	
dicates the direction of IDC interference. Value eutra indicates that only E-UTRA is victim of IDC interf	erence, value
ther indicates that only another radio is victim of IDC interference and value both indicates that both E-	
nother radio are victims of IDC interference. The other radio refers to either the ISM radio or GNSS (se	
33]).	
nterferenceDirectionMRDC	
indicates the direction of IDC interference. Value <i>eutra-nr</i> indicates E-UTRA and NR is victim, value <i>nr</i> in	ndicates NR.
alue other indicates other radio system and so on. The other radio refers to either the ISM radio or GNS	
6.816 [63]).	(000
ictimSystemType	
idicate the list of victim system types to which IDC interference is caused from E-UTRA when configure	ed with LIL CA
r from E-UTRA and NR when configured with MR-DC. Value gps, glonass, bds and galileo indicates the	
NSS. Value <i>wan</i> indicates WLAN and value <i>bluetooth</i> indicates Bluetooth.	0.900.0

InterFreqRSTDMeasurementIndication

The *InterFreqRSTDMeasurementIndication* message is used to indicate that the UE is going to either start or stop OTDOA inter-frequency RSTD measurement which requires measurement gaps as specified in TS 36.133 [16], clause 8.1.2.6. The *InterFreqRSTDMeasurementIndication* message is also used to indicate to the network that the UE is going to start/stop OTDOA intra-frequency RSTD measurements which require measurement gaps. The *InterFreqRSTDMeasurementIndication* message is also used to indicate to the network the measurement gap that the category M1 or M2 UE prefers to perform RSTD measurements with dense PRS configuration, as specified in TS

36.133 [16], Table 8.1.2.1-3.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

InterFreqRSTDMeasurementIndication message

```
InterFreqRSTDMeasurementIndication-r10 ::=
                                                       SEQUENCE {
                          CHOICE {
    criticalExtensions
                                              CHOICE {
        c1
             interFreqRSTDMeasurementIndication-r10 InterFreqRSTDMeasurementIndication-r10-IEs,
             spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                              SEQUENCE { }
    }
}
InterFreqRSTDMeasurementIndication-r10-IEs ::=
                                                       SEQUENCE {
   rstd-InterFreqIndication-r10 CHOICE {
                                              SEQUENCE {
        start
            rstd-InterFreqInfoList-r10
                                                      RSTD-InterFreqInfoList-r10
        }.
        stop
                                              NULL
    lateNonCriticalExtension
                                          OCTET STRING
                                                                                 OPTIONAL,
    nonCriticalExtension
                                          SEQUENCE { }
                                                                                 OPTIONAL
}
RSTD-InterFreqInfoList-r10 ::= SEQUENCE (SIZE(1..maxRSTD-Freq-r10)) OF RSTD-InterFreqInfo-r10
RSTD-InterFreqInfo-r10 ::= SEQUENCE {
    carrierFreq-r10
                                      ARFCN-ValueEUTRA,
    measPRS-Offset-r10
                                      INTEGER (0..39),
    [[ carrierFreq-v1090
                                    ARFCN-ValueEUTRA-v9e0
                                                                            OPTIONAL
    11,
    [[ measPRS-Offset-r15 CHOICE {
                                 INTEGER (0..79)
            rstd0-r15
                                     INTEGER (0..159),
            rstd1-r15
                                     INTEGER (0..319),
INTEGER (0..639),
            rstd2-r15
            rstd3-r15
                                     INTEGER (0..1279),
            rstd4-r15
             rstd5-r15
                                      INTEGER (0..159),
            rstd6-r15
                                     INTEGER (0..319),
            rstd7-r15
                                     INTEGER (0..639),
INTEGER (0..1279),
            rstd8-r15
            rstd9-r15
                                    INTEGER (0..319),
            rstd10-r15
                                      INTEGER (0..639),
                                     INTEGER (0..1279),
            rstd11-r15
                                    INTEGER (0..319),
INTEGER (0..639),
            rstd12-r15
             rstd13-r15
                                   INTEGER (0..639),
INTEGER (0..1279),
INTEGER (0..639),
            rstd14-r15
                               INTEGER (0..639),
INTEGER (0..639),
INTEGER (0..639),
INTEGER (0..639),
INTEGER (0..639),
            rstd15-r15
            rstd16-r15
            rstd17-r15
             rstd18-r15
            rstd19-r15
            rstd20-r15
                                     INTEGER (0..1279)
        }
                                                                    OPTTONAL.
    ]]
}
-- ASN1STOP
```

InterFreqRSTDMeasurementIndication field descriptions

carrierFreq

The EARFCN value of the carrier received from upper layers for which the UE needs to perform the inter-frequency RSTD measurements. If the UE includes *carrierFreq-v1090*, it shall set *carrierFreq-r10* to *maxEARFCN*. In case the UE starts intra-frequency RSTD measurements the *carrierFreq* indicates the carrier frequency of the serving cell. *measPRS-Offset*

Indicates the requested gap offset for performing inter-frequency or intra-frequency RSTD measurements. It is the smallest subframe offset from the beginning of subframe 0 of SFN=0 of the serving cell of the requested gap for measuring PRS positioning occasions in the carrier frequency *carrierFreq* for which the UE needs to perform the inter-frequency or intra-frequency RSTD measurements. The PRS positioning occasion information is received from upper layers. The value of *measPRS-Offset-r10* is obtained by mapping the starting subframe of the PRS positioning occasion in the measured cell onto the corresponding subframe in the serving cell and is calculated as the serving cell's number of subframes from SFN=0 mod 40.

If *measPRS-Offset-r15* is included, the field further indicates the requested gap pattern that the category M1 or M2 UE prefers to perform RSTD measurements with dense PRS configuration, as specified in TS 36.133 [16], Table 8.1.2.1-3, where value rstd0 corresponds to Gap Pattern Id rstd0, value rstd1 corresponds to Gap Pattern Id rstd1 and so on. The value of *measPRS-Offset-r15* is obtained by mapping the starting subframe of the PRS positioning occasion in the measured cell onto the corresponding subframe in the serving cell and is calculated as the serving cell's number of subframes from SFN=0 mod MGRP corresponding to the requested Gap pattern Id. If *measPRS-Offset-r15* is included, *measPRS-Offset-r10* is ignored.

The UE shall take into account any additional time required by the UE to start PRS measurements on the other carrier when it does this mapping for determining the *measPRS-Offset*.

NOTE: Figure 6.2.2-1 illustrates the measPRS-Offset field.

rstd-InterFreqIndication

Indicates the inter-frequency or intra-frequency RSTD measurement action, i.e. the UE is going to start or stop interfrequency or intra-frequency RSTD measurement.

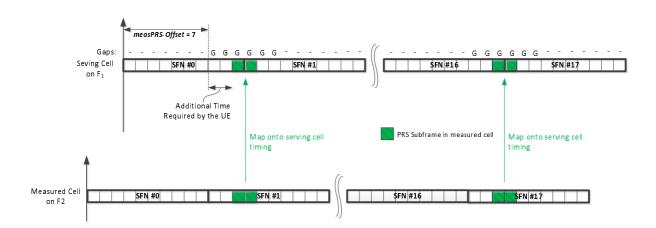


Figure 6.2.2-1 (informative): Exemplary calculation of measPRS-Offset field.

LoggedMeasurementConfiguration

The *LoggedMeasurementConfiguration* message is used by E-UTRAN to configure the UE to perform logging of measurement results while in RRC_IDLE or to perform logging of measurement results for MBSFN while in both RRC_IDLE and RRC_CONNECTED. It is used to transfer the logged measurement configuration for network performance optimisation, see TS 37.320 [60].

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

LoggedMeasurementConfiguration message

```
-- ASN1START
LoggedMeasurementConfiguration-r10 ::= SEQUENCE {
     criticalExtensions
                                                   CHOICE {
                                                      CHOICE {
         c1
                                                                  LoggedMeasurementConfiguration-r10-IEs,
               loggedMeasurementConfiguration-r10
               spare3 NULL, spare2 NULL, spare1 NULL
          },
          criticalExtensionsFuture
                                                             SEQUENCE { }
     }
}
    traceReference-r10TraceReference-r10,traceRecordingSessionRef-r10OCTET STRING (SIZE (2)),tce-Id-r10OCTET STRING (SIZE (1)),absoluteTimeInfo-r10AbsoluteTimeInfo-r10,areaConfiguration-r10LoggingDuration-r10loggingInterval-r10LoggingInterval-r10,nonCriticalExtensionLoggedMeasurementConfiguration
LoggedMeasurementConfiguration-r10-IEs ::= SEQUENCE {
                                                                                  OPTIONAL, -- Need OR
                                             LoggedMeasurementConfiguration-v1080-IEs OPTIONAL
}
LoggedMeasurementConfiguration-v1080-IEs ::= SEQUENCE {
    lateNonCriticalExtension-r10 OCTET STRING
                                                                                            OPTIONAL,
     nonCriticalExtension
                                             LoggedMeasurementConfiguration-v1130-IEs OPTIONAL
}
LoggedMeasurementConfiguration-v1130-IEs ::= SEQUENCE {

    plmn-IdentityList-r11
    PLMN-IdentityList3-r11
    OPTIONAL, -- Need OR

    areaConfiguration-v1130
    AreaConfiguration-v1130
    OPTIONAL, -- Need OR

    nonCriticalExtension
    LoggedMeasurementConfiguration-v1250-IEs
    OPTIONAL

}
LoggedMeasurementConfiguration-v1250-IEs ::= SEQUENCE {
     targetMBSFN-AreaList-r12 TargetMBSFN-AreaList-r12
                                                                                  OPTIONAL,
                                                                                               -- Need OP
     nonCriticalExtension
                                             LoggedMeasurementConfiguration-v1530-IEs
     OPTIONAL
}
LoggedMeasurementConfiguration-v1530-IEs ::= SEQUENCE {
     bt-NameList-r15 BT-NameList-r15
wlan-NameList-r15 WLAN-NameList-r15
    bt-NameList-r15
                                                                                      OPTIONAL,
                                                                                                      --Need OR
                                                                                                      --Need OR
                                                                                      OPTIONAL,
    nonCriticalExtension
                                            SEQUENCE { }
                                                                                       OPTTONAL
}
TargetMBSFN-AreaList-r12 ::=
                                                SEQUENCE (SIZE (0..maxMBSFN-Area)) OF TargetMBSFN-Area-r12
TargetMBSFN-Area-r12 ::=
                                                  SEQUENCE {
                                                                                 OPTIONAL, -- Need OR
                                                  MBSFN-AreaId-r12
    mbsfn-AreaId-r12
     carrierFreq-r12
                                                  ARFCN-ValueEUTRA-r9,
     . . .
}
```

-- ASN1STOP

LoggedMeasurementConfiguration field descriptions
absoluteTimeInfo
Indicates the absolute time in the current cell.
areaConfiguration
Used to restrict the area in which the UE performs measurement logging to cells broadcasting either one of the
included cell identities or one of the included tracking area codes/ identities.
plmn-IdentityList
Indicates a set of PLMNs defining when the UE performs measurement logging as well as the associated status
indication and information retrieval i.e. the UE performs these actions when the RPLMN is part of this set of PLMNs.
targetMBSFN-AreaList
Used to indicate logging of MBSFN measurements and further restrict the area and frequencies for which the UE
performs measurement logging for MBSFN. If both MBSFN area id and carrier frequency are present, a specific
MBSFN area is indicated. If only carrier frequency is present, all MBSFN areas on that carrier frequency are indicated.
If there is no entry in the list, any MBSFN area is indicated.
tce-ld
Parameter Trace Collection Entity Id: See TS 32.422 [58].
traceRecordingSessionRef
Parameter Trace Recording Session Reference: See TS 32.422 [58]

MasterInformationBlock

The MasterInformationBlock includes the system information transmitted on BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

MasterInformationBlock

-- ASN1START

```
SEQUENCE {
MasterInformationBlock ::=
   dl-Bandwidth
                                       ENUMERATED {
                                            n6, n15, n25, n50, n75, n100},
                                        PHICH-Config,
   phich-Config
   schedulingInfoSIB1-BR-r13
                                       BIT STRING (SIZE (8)),
INTEGER (0..31),
    systemInfoUnchanged-BR-r15
                                       BOOLEAN,
                                        BIT STRING (SIZE (4))
    spare
```

-- ASN1STOP

}

MasterInformationBlock field descriptions

dl-Bandwidth
Parameter: transmission bandwidth configuration, NRB in downlink, see TS 36.101 [42], table 5.6-1. n6 corresponds to
6 resource blocks, n15 to 15 resource blocks and so on.
phich-Config
Specifies the PHICH configuration. If the UE is a BL UE or UE in CE, it shall ignore this field.
schedulingInfoSIB1-BR
Indicates the index to the tables that define <i>SystemInformationBlockType1-BR</i> scheduling information. The tables are
specified in TS 36.213 [23], Table 7.1.6-1 and Table 7.1.7.2.7-1. Value 0 means that SystemInformationBlockType1-
BR is not scheduled.
systemFrameNumber
Defines the 8 most significant bits of the SFN. As indicated in TS 36.211 [21], 6.6.1, the 2 least significant bits of the
SFN are acquired implicitly in the P-BCH decoding, i.e. timing of 40ms P-BCH TTI indicates 2 least significant bits
(within 40ms P-BCH TTI, the first radio frame: 00, the second radio frame: 01, the third radio frame: 10, the last radio
frame: 11). One value applies for all serving cells of a Cell Group (i.e. MCG or SCG). The associated functionality is
common (i.e. not performed independently for each cell).
systemInfoUnchanged-BR
Value TRUE indicates that no change has occurred in the SIB1-BR and SI messages at least over the SI validity time.

MasterInformationBlock-MBMS

The MasterInformationBlock-MBMS includes the system information transmitted on BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

MasterInformationBlock-MBMS

SEQUENCE {

```
-- ASN1START
```

```
MasterInformationBlock-MBMS-r14 ::=
    dl-Bandwidth-MBMS-r14
```

```
systemFrameNumber-r14
additionalNonMBSFNSubframes-r14
spare
```

ENUMERATED { n6, n15, n25, n50, n75, n100}, BIT STRING (SIZE (6)), INTEGER (0..3), BIT STRING (SIZE (13))

-- ASN1STOP

}

MasterInformationBlock-MBMS field descriptions

additionalNonMBSFNSubframes

Configures additional non-MBSFN subframes where SystemInformationBlockType1-MBMS and SystemInformation-MBMS may be transmitted. Value 0, 1, 2, 3 mean zero, one, two, three additional non-MBSFN subframes are configured after each subframe which has PBCH.

dl-Bandwidth-MBMS

Parameter: transmission bandwidth configuration, NRB in downlink, see TS 36.101 [42], table 5.6-1. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on.

systemFrameNumber

Defines the 6 most significant bits of the SFN of the MBMS-dedicated cell. As indicated in TS 36.211 [21], clause 6.6.1, the 4 least significant bits of the SFN are acquired implicitly in the P-BCH decoding, i.e. timing of 160ms P-BCH TTI indicates 4 least significant bits (within 40ms P-BCH TTI, the first radio frame: 00, the fourth radio frame: 01, the eighth radio frame: 10, the last radio frame: 11).

MBMSCountingRequest

The MBMSCountingRequest message is used by E-UTRAN to count the UEs that are receiving or interested to receive specific MBMS services.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: MCCH

Direction: E-UTRAN to UE

MBMSCountingRequest message

```
-- ASN1START
MBMSCountingRequest-r10 ::=
                                SEQUENCE {
    countingRequestList-r10
lateNonCritic
                                CountingRequestList-r10,
    lateNonCriticalExtension
                                    OCTET STRING
                                                                          OPTIONAL,
                                    SEQUENCE { }
    nonCriticalExtension
                                                                          OPTIONAL
}
CountingRequestList-r10 ::= SEQUENCE (SIZE (1..maxServiceCount)) OF CountingRequestInfo-r10
CountingReguestInfo-r10 ::=
                                SEOUENCE {
    tmgi-r10
                                         TMGI-r9,
    . . .
```

}

-- ASN1STOP

MBMSCountingResponse

The *MBMSCountingResponse* message is used by the UE to respond to an *MBMSCountingRequest* message.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

MBMSCountingResponse message

```
SEQUENCE {
MBMSCountingResponse-r10 ::=
    criticalExtensions
                                            CHOICE {
        c1
                                               CHOICE {
             countingResponse-r10
                                                    MBMSCountingResponse-r10-IEs,
             spare3 NULL, spare2 NULL, spare1 NULL
         },
         criticalExtensionsFuture
                                                SEQUENCE { }
    }
}
MBMSCountingResponse-r10-IES ::= SEQUENCE {
  mbsfn-AreaIndex-r10 INTEGER (0..maxMBSFN-Area-1)
    mbsfn-AreaIndex-r10
countingResponseList-r10
lateNonCriticalExtension
                                                                                                OPTIONAL,
                                      CountingResponseList-r10
                                                                              OPTIONAL,
                                     OCTET STRING
                                                                              OPTIONAL.
    nonCriticalExtension
                                      SEQUENCE { }
                                                                              OPTIONAL
}
CountingResponseList-r10 ::=
                                       SEQUENCE (SIZE (1..maxServiceCount)) OF CountingResponseInfo-r10
CountingResponseInfo-r10 ::=
                                       SEQUENCE {
    countingResponseService-r10 INTEGER (0..maxServiceCount-1),
}
```

-- ASN1STOP

MBMSCountingResponse field descriptions

List of MBMS services which the UE is receiving or interested to receive. Value 0 for field *countingResponseService* corresponds to the first entry in *countingRequestList* within *MBMSCountingRequest*, value 1 corresponds to the second entry in this list and so on.

mbsfn-AreaIndex

countingResponseList

Index of the entry in field *mbsfn-AreaInfoList* within *SystemInformationBlockType13*. Value 0 corresponds to the first entry in *mbsfn-AreaInfoList* within *SystemInformationBlockType13*, value 1 corresponds to the second entry in this list and so on.

MBMSInterestIndication

The *MBMSInterestIndication* message is used to inform E-UTRAN that the UE is receiving/ interested to receive or no longer receiving/ interested to receive MBMS via an MRB or SC-MRB including MBMS service(s) in receive only mode.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

MBMSInterestIndication message

```
-- ASN1START
```

```
MBMSInterestIndication-r11 ::=
                                 SEQUENCE {
                                CHOICE {
    criticalExtensions
                                     CHOICE {
       c1
           interestIndication-r11
                                            MBMSInterestIndication-r11-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
       },
       criticalExtensionsFuture
                                        SEQUENCE { }
   }
}
MBMSInterestIndication-r11-IEs ::= SEQUENCE {

    mbms-FreqList-r11
    CarrierFreqListMBMS-r11
    OPTIONAL,

    mbms-Priority-r11
    ENUMERATED {true}
    OPTIONAL,

   lateNonCriticalExtension
                                    OCTET STRING
                                                                      OPTIONAL,
   nonCriticalExtension
                                    MBMSInterestIndication-v1310-IEs
                                                                      OPTIONAL
}
MBMSInterestIndication-v1310-IEs ::= SEQUENCE {
   mbms-Services-r13
                                    MBMS-ServiceList-r13
                                                                     OPTIONAL
    nonCriticalExtension
                                     MBMSInterestIndication-v1540-IEs
                                                                         OPTIONAL
}
MBMSInterestIndication-v1540-IEs ::= SEQUENCE {
   mbms-ROM-InfoList-r15 SEQUENCE (SIZE(1..maxMBMS-ServiceListPerUE-r13)) OF MBMS-ROM-
Info-r15
                                                                      OPTIONAL,
                                    SEQUENCE { }
   nonCriticalExtension
                                                                      OPTIONAL
}
ENUMERATED {n6, n15, n25, n50, n75, n100}
```

-- ASN1STOP

MBMSInterestIndication field descriptions mbms-Bandwidth Indicates the UE received MBMS service frequency bandwidth configuration, N_{RB} in downlink, see TS 36.101 [42], table 5.6-1. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. mbms-FreqList List of MBMS frequencies on which the UE is receiving or interested to receive MBMS via an MRB or SC-MRB. mbms-Priority Indicates whether the UE prioritises MBMS reception above unicast reception. The field is present (i.e. value true), if the UE prioritises reception of all listed MBMS frequencies above reception of any of the unicast bearers. Otherwise the field is absent. mbms-ROM-Frea The value indicates the carrier frequency used by the UE to receive MBMS service(s) in receive only mode. mbms-ROM-InfoList List of receive only mode MBMS service(s) related parameters which the UE is receiving or interested to receive. mbms-ROM-SubcarrierSpacing The value indicates subcarrier spacing for MBSFN subframes received by UE in receive only mode and kHz15 refers to 15kHz, kHz7dot5 refers to 7.5kHz subcarrier spacing and kHz1dot25 refers to 1.25 kHz subcarrier spacing as

MBSFNAreaConfiguration

The *MBSFNAreaConfiguration* message contains the MBMS control information applicable for an MBSFN area. For each MBSFN area included in *SystemInformationBlockType13* E-UTRAN configures an MCCH (i.e. the MCCH identifies the MBSFN area) and signals the *MBSFNAreaConfiguration* message.

Signalling radio bearer: N/A

defined in TS 36.211 [21], clause 6.12.

RLC-SAP: UM

Logical channel: MCCH

Direction: E-UTRAN to UE

MBSFNAreaConfiguration message

```
-- ASN1START
MBSFNAreaConfiguration-r9 ::=
                                   SEQUENCE {
   commonSF-Alloc-r9
                                    CommonSF-AllocPatternList-r9,
                                       ENUMERATED {
    commonSF-AllocPeriod-r9
                                               rf4, rf8, rf16, rf32, rf64, rf128, rf256},
    pmch-InfoList-r9
                                       PMCH-InfoList-r9,
    nonCriticalExtension
                                       MBSFNAreaConfiguration-v930-IEs OPTIONAL
}
MBSFNAreaConfiguration-v930-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING
                                                                           OPTIONAL,
    nonCriticalExtension
                                       MBSFNAreaConfiguration-v1250-IEs
                                                                           OPTIONAL
}
MBSFNAreaConfiguration-v1250-IEs ::= SEQUENCE {
                                      PMCH-InfoListExt-r12
   pmch-InfoListExt-r12
                                                                           OPTIONAL,
                                                                                       -- Need OR
   nonCriticalExtension
                                       MBSFNAreaConfiguration-v1430-IEs
                                                                           OPTIONAL
}
MBSFNAreaConfiguration-v1430-IEs ::= SEQUENCE {
   commonSF-Alloc-r14
                                       CommonSF-AllocPatternList-r14,
                                       SEQUENCE { }
   nonCriticalExtension
                                                                           OPTIONAL
}
CommonSF-AllocPatternList-r9 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-
SubframeConfig
CommonSF-AllocPatternList-r14 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-
SubframeConfig-v1430
-- ASN1STOP
```

MBSFNAreaConfiguration field descriptions

commonSF-Alloc

Indicates the subframes allocated to the MBSFN area. E-UTRAN always sets this field to cover at least the subframes configured by *SystemInformationBlockType13* for this MCCH, regardless of whether any MBMS sessions are ongoing. *commonSF-AllocPeriod*

Indicates the period during which resources corresponding with field *commonSF-Alloc* are divided between the (P)MCH that are configured for this MBSFN area. The subframe allocation patterns, as defined by *commonSF-Alloc*, repeat continously during this period. Value rf4 corresponds to 4 radio frames, rf8 corresponds to 8 radio frames and so on. The *commonSF-AllocPeriod* starts in the radio frames for which: SFN mod *commonSF-AllocPeriod* = 0. *pmch-InfoList*

EUTRAN may include *pmch-InfoListExt* even if *pmch-InfoList* does not include *maxPMCH-PerMBSFN* entries. EUTRAN configures at most *maxPMCH-PerMBSFN* entries i.e. across *pmch-InfoList* and *pmch-InfoListExt*.

MeasReportAppLayer

The MeasReportAppLayer message is used for sending application layer measurement report.

Signalling radio bearer: SRB4

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

MeasReportAppLayer message

-- ASN1START

```
MeasReportAppLayer-r15 ::=
                             SEQUENCE {
       measReportAppLayer-r15 CHOICE {
   criticalExtensions
                                          MeasReportAppLayer-r15-IEs,
       criticalExtensionsFuture
                                          SEQUENCE { }
    }
}
MeasReportAppLayer-r15-IEs ::=
                                 SEQUENCE {
   measReportAppLayerContainer-r15 OCTET STRING (SIZE(1..8000))
                                                                              OPTIONAL,
                                       ENUMERATED { qoe, qoemtsi, spare6, spare5, spare4, spare3,
   serviceType
                  OPTIONAL,
spare2, spare1}
                                       SEQUENCE { }
   nonCriticalExtension
                                                                      OPTIONAL
}
```

-- ASN1STOP

MeasReportAppLayer field descriptions

measReportAppLayerContainer The field contains container of application layer measurements, see Annex L (normative) in TS 26.247 [90] and clause 16.5 in TS 26.114 [99].

serviceType

Indicates the type of application layer measurement. Value qoe indicates Quality of Experience Measurement Collection for streaming services, value qoemtsi indicates Quality of Experience Measurement Collection for MTSI.

MeasurementReport

The *MeasurementReport* message is used for the indication of measurement results.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

MeasurementReport message

```
-- ASN1START
MeasurementReport ::=
                                   SEQUENCE {
                                   CHOICE {
   criticalExtensions
                                       CHOICE {
       c1
           measurementReport-r8
                                               MeasurementReport-r8-IEs,
           spare7 NULL,
           spare6 NULL, spare5 NULL, spare4 NULL,
           spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                           SEQUENCE { }
    }
}
MeasurementReport-r8-IEs ::= SEQUENCE {
                                    MeasResults,
   measResults
                                       MeasurementReport-v8a0-IEs
   nonCriticalExtension
                                                                          OPTIONAL
}
MeasurementReport-v8a0-IEs ::= SEQUENCE {
  lateNonCriticalExtension OCTET STRING
nonCriticalExtension SEQUENCE {}
                                                                           OPTIONAL,
                                                                           OPTIONAL
}
-- ASN1STOP
```

MobilityFromEUTRACommand

The *MobilityFromEUTRACommand* message is used to command handover or a cell change from E-UTRA to another RAT (3GPP or non-3GPP), or enhanced CS fallback to CDMA2000 1xRTT.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: E-UTRAN to UE

MobilityFromEUTRACommand message

```
MobilityFromEUTRACommand ::=
                             er RRC-TransactionIdentifier,
CHOICE {
                                      SEQUENCE {
    rrc-TransactionIdentifier
    criticalExtensions
            mobilityFromEUTRACommand-r8 Mob
        c1
            mobilityFromEUTRACommand-r8 MobilityFromEUTRACommand-r8-IEs,
mobilityFromEUTRACommand-r9 MobilityFromEUTRACommand-r9-IEs,
            spare2 NULL, spare1
        },
                                            SEQUENCE { }
        criticalExtensionsFuture
    }
}
MobilityFromEUTRACommand-r8-IEs ::= SEQUENCE {
    cs-FallbackIndicator
                                          BOOLEAN,
                                          CHOICE {
    purpose
        handover
                                               Handover,
        cellChangeOrder
                                               CellChangeOrder
    }.
    nonCriticalExtension
                                          MobilityFromEUTRACommand-v8a0-IEs OPTIONAL
```

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MobilityFromEUTRACommand-v8a0-IEs ::= SEQUENCE { lateNonCriticalExtension OCTET STRING OPTIONAL, MobilityFromEUTRACommand-v8d0-IEs OPTIONAL nonCriticalExtension } MobilityFromEUTRACommand-v8d0-IEs ::= SEQUENCE { BandIndicatorGERAN OPTIONAL, -- Cond GERAN bandIndicator nonCriticalExtension SEQUENCE { } OPTIONAL } MobilityFromEUTRACommand-r9-IEs ::= SEQUENCE { cs-FallbackIndicator BOOLEAN, purpose CHOICE { handover Handover, cellChangeOrder CellChangeOrder, e-CSFB-r9 E-CSFB-r9, . . . }, MobilityFromEUTRACommand-v930-IEs OPTIONAL nonCriticalExtension } MobilityFromEUTRACommand-v930-IEs ::= SEQUENCE { lateNonCriticalExtension OCTET STRING OPTIONAL. MobilityFromEUTRACommand-v960-IES OPTIONAL nonCriticalExtension } MobilityFromEUTRACommand-v960-IEs ::= SEQUENCE { BandIndicatorGERAN OPTIONAL, bandIndicator -- Cond GERAN nonCriticalExtension MobilityFromEUTRACommand-v1530-IEs OPTIONAL } MobilityFromEUTRACommand-v1530-IEs ::= SEQUENCE { MTC-SSB-NR-r15 OPTIONAL, SEQUENCE {} OPTIONAL smtc-r15 -- Need OP nonCriticalExtension SEQUENCE { } OPTIONAL } Handover ::= SEQUENCE { targetRAT-Type ENUMERATED { utra, geran, cdma2000-1XRTT, cdma2000-HRPD, nr, eutra, spare2, spare1, ... }, targetRAT-MessageContainer OCTET STRING, nas-SecurityParamFromEUTRA OCTET STRING (SIZE (1)) OPTIONAL, -- Cond UTRAGERANEPC systemInformation SI-OrPSI-GERAN OPTIONAL -- Cond PSHO } CellChangeOrder ::= SEQUENCE { t304 ENUMERATED { ms100, ms200, ms500, ms1000, ms2000, ms4000, ms8000, ms10000-v1310}, targetRAT-Type CHOICE { geran SEQUENCE { PhysCellIdGERAN, physCellId carrierFreq CarrierFreqGERAN, networkControlOrder BIT STRING (SIZE (2)) OPTIONAL, -- Need OP -- Need OP systemInformation SI-OrPSI-GERAN OPTIONAL }, . . . } } SI-OrPSI-GERAN ::= CHOICE { SystemInfoListGERAN, si psi SystemInfoListGERAN } E-CSFB-r9 ::= SEQUENCE { OCTET STRING messageContCDMA2000-1XRTT-r9 OPTIONAL, -- Need ON mobilityCDMA2000-HRPD-r9 ENUMERATED { handover, redirection messageContCDMA2000-HRPD-r9 OCTET STRING OPTIONAL, -- Need OP -- Cond concHO OPTIONAL, redirectCarrierCDMA2000-HRPD-r9 CarrierFreqCDMA2000 OPTIONAL -- Cond concRedir }

-- ASN1STOP

MobilityFromEUTRACommand field descriptions		
bandIndicator		
	ne ARFCN of the BCCH carrier.	
carrierFreq		
•	ncy of the target GERAN cell.	
cs-FallbackIndicator		
	e CS fallback procedure to UTRAN or GERAN is triggered.	
messageContCDMA2000		
•	ge specified in CDMA2000 1xRTT standard that either tells the UE to move to specific 1xRTT	
	failure to allocate resources for the enhanced CS fallback to CDMA2000 1xRTT.	
messageContCDMA2000		
	ge specified in CDMA2000 HRPD standard that either tells the UE to move to specific HRPD	
	failure to allocate resources for the handover to CDMA2000 HRPD.	
mobilityCDMA2000-HRPL		
	r or not mobility to CDMA2000 HRPD is to be performed by the UE and it also indicates the	
	000 HRPD that is to be performed; If this field is not present the UE shall perform only the	
enhanced CS fallback to C		
nas-SecurityParamFromE		
	t to "eutra" and the source CN is 5GC, this field is used to deliver the key synchronisation	
	Key freshness for the 5GS to EPS handovers as specified in TS 33.501 [86] and the content	
	in TS 24.501 [95]. Otherwise, this field is used to deliver the key synchronisation and Key	
	I to UTRAN handovers as specified in TS 33.401 [32] and the content of the parameter is	
defined in TS24.301 [35].		
networkControlOrder		
Parameter NETWORK_CC	NTROL_ORDER in TS 44.060 [36].	
purpose		
	bility procedure the UE is requested to perform. EUTRAN always applies value e-CSFB in	
	ack to CDMA2000 (e.g. also when that procedure results in handover to CDMA2000 1XRTT	
	2000 HRPD only or in redirection to CDMA2000 HRPD only),	
redirectCarrierCDMA2000		
The redirectCarrierCDMA2	000-HRPD indicates a CDMA2000 carrier frequency and is used to redirect the UE to a	
HRPD carrier frequency.		
smtc		
The SSB periodicity/offset/o	duration configuration of target cell for inter-RAT handover to NR. It is based on timing	
reference of EUTRA PCell.	If the field is absent, the UE uses the SMTC in the <i>measObjectNR</i> having the same SSB	
frequency and subcarrier s	pacing, as configured before the reception of the RRC message.	
SystemInfoListGERAN		
	der and if the field is not present, the UE has to acquire SI/PSI from the GERAN cell.	
t304		
Timer T304 as described in	n clause 7.3. Value ms100 corresponds with 100 ms, ms200 corresponds with 200 ms and	
	xtended value ms10000-v1310 only when UE supports CE.	
targetRAT-Type		
Indicates the target RAT ty	De.	
targetRAT-MessageConta		
	ge specified in another standard, as indicated by the <i>targetRAT-Type</i> , and carries	
	t cell identifier(s) and radio parameters relevant for the target radio access technology.	
NOTE 1.		
A complete message is inc	luded, as specified in the other standard.	
• • • • •		
Conditional presence	Explanation	
concHO	The field is mandatory present if the <i>mobilityCDMA2000-HRPD</i> is set to " <i>handover</i> ";	

The field is mandatory present if the mobilityCDMA2000-HRPD is set to "handover";	
otherwise the field is optional present, need ON.	
The field is mandatory present if the mobilityCDMA2000-HRPD is set to "redirection";	
otherwise the field is not present.	
The field should be present if the purpose is set to "handover" and the targetRAT-Type is	
set to "geran"; otherwise the field is not present	
The field is mandatory present in case of PS handover toward GERAN; otherwise the	
field is optionally present, but not used by the UE	
The field is mandatory present if the targetRAT-Type is set to "utra" or "geran" or if the	
targetRAT-Type is set to "eutra" and the source CN is 5GC; otherwise the field is not	
present	

NOTE 1: The correspondence between the value of the *targetRAT-Type*, the standard to apply and the message contained within the *targetRAT-MessageContainer* is shown in the table below:

targetRAT-Type	Standard to apply	targetRAT-MessageContainer
cdma2000-	C.S0001 or later, C.S0007 or later, C.S0008 or	
1XRTT	later	
cdma2000-HRPD	C.S0024 or later	
eutra	TS 36.331 (clause 5.4.2)	RRCConnectionReconfiguration
geran	GSM TS 04.18, version 8.5.0 or later, or TS 44.018 (clause 9.1.15)	HANDOVER COMMAND
	TS 44.060, version 6.13.0 or later (clause 11.2.43)	PS HANDOVER COMMAND
	TS 44.060, version 7.6.0 or later (clause 11.2.46)	DTM HANDOVER COMMAND
nr	TS 38.331 (clause 6.2.2)	RRCReconfiguration
utra	TS 25.331 (clause 10.2.16a)	HANDOVER TO UTRAN COMMAND

Paging

The *Paging* message is used for the notification of one or more UEs.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: PCCH

Direction: E-UTRAN to UE

Paging message

-- ASN1START

_

etws-Indication	E { PagingRecordList ENUMERATED {true} ENUMERATED {true} Paging-v890-IEs	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need ON Need ON
<pre>Paging-v890-IEs ::= SEQUENC lateNonCriticalExtension nonCriticalExtension }</pre>		OPTIONAL, OPTIONAL	
Paging-v920-IEs ::= SEQUENC cmas-Indication-r9 nonCriticalExtension }		OPTIONAL, OPTIONAL	Need ON
<pre>Paging-v1130-IEs ::= SEQ eab-ParamModification-r11 nonCriticalExtension }</pre>		OPTIONAL, OPTIONAL	Need ON
<pre>Paging-v1310-IEs ::= SEQ redistributionIndication-r13 systemInfoModification-eDRX-r13 nonCriticalExtension }</pre>	ENUMERATED {true}	OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need ON
Paging-v1530-IEs ::= SEQ accessType nonCriticalExtension }	UENCE { ENUMERATED {non3GPP} SEQUENCE {}	OPTIONAL, OPTIONAL	Need ON
PagingRecordList ::=	SEQUENCE (SIZE (1maxPageRec)) OF	PagingRecord	
PagingRecord ::= ue-Identity cn-Domain }	SEQUENCE { PagingUE-Identity, ENUMERATED {ps, cs},		

PagingUE-Identity ::= s-TMSI imsi	CHOICE { S-TMSI, IMSI,
ng-5G-S-TMSI-r15 fullI-RNTI-r15 }	NG-5G-S-TMSI-r15, I-RNTI-r15
IMSI ::=	SEQUENCE (SIZE (621)) OF IMSI-Digit
IMSI-Digit ::=	INTEGER (09)

-- ASN1STOP

Paging field descriptions

accessType
It indicates whether Paging is originated due to the PDU sessions from the non-3GPP access when E-UTRA is
connected to 5GC.
cmas-Indication
If present: indication of a CMAS notification.
<i>cn-Domain</i>
Indicates the origin of paging.
eab-ParamModification
If present: indication of an EAB parameters (SIB14) modification.
etws-Indication
If present: indication of an ETWS primary notification and/ or ETWS secondary notification.
imsi
The International Mobile Subscriber Identity, a globally unique permanent subscriber identity, see TS 23.003 [27]. The
first element contains the first IMSI digit, the second element contains the second IMSI digit and so on.
redistributionIndication
If present: indication to trigger E-UTRAN inter-frequency redistribution procedure as specified in TS 36.304 [4], clause
5.2.4.10.
systemInfoModification
If present: indication of a BCCH modification other than SIB10, SIB11, SIB12 and SIB14. This indication does not
apply to UEs using eDRX cycle longer than the BCCH modification period.
systemInfoModification-eDRX
If present: indication of a BCCH modification other than SIB10, SIB11, SIB12 and SIB14. This indication applies only
to UEs using eDRX cycle longer than the BCCH modification period.
ue-Identity
Provides the NAS identity of the UE that is being paged. The IMSI is not applicable for E-UTRA/5GC.

ProximityIndication

The *ProximityIndication* message is used to indicate that the UE is entering or leaving the proximity of one or more CSG member cell(s).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

ProximityIndication message

```
-- ASN1START
```

```
ProximityIndication-r9 ::= SEQUENCE {
    criticalExtensions CHOICE {
        cl CHOICE {
            proximityIndication-r9 ProximityIndication-r9-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture SEQUENCE {}
}
```

ProximityIndication-r9-IEs ::= SEQUENCE type-r9 carrierFreq-r9 eutra-r9 utra-r9	<pre>{ ENUMERATED {entering, leaving}, CHOICE { ARFCN-ValueEUTRA, ARFCN-ValueUTRA,</pre>	
, eutra2-v9e0 },	ARFCN-ValueEUTRA-v9e0	
nonCriticalExtension OPTIONAL	ProximityIndication-v930-IEs	
}		
ProximityIndication-v930-IEs ::= SEQUENC	CE {	
lateNonCriticalExtension	OCTET STRING	OPTIONAL,
nonCriticalExtension	SEQUENCE { }	OPTIONAL
}		
ASN1STOP		

ProximityIndication field descriptions

carrierFreq Indicates the RAT and frequency of the CSG member cell(s), for which the proximity indication is sent. For E-UTRA and UTRA frequencies, the UE shall set the ARFCN according to a band it previously considered suitable for accessing (one of) the CSG member cell(s), for which the proximity indication is sent. *type*

Used to indicate whether the UE is entering or leaving the proximity of CSG member cell(s).

RNReconfiguration

The *RNReconfiguration* is a command to modify the RN subframe configuration and/or to convey changed system information.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to RN

RNReconfiguration message

```
-- ASN1START
RNReconfiguration-r10 ::= SEQUENCE {
    rrc-TransactionIdentifier RRC-TransactionIdentifier,
criticalExtensions CHOICE {
cl CHOICE {
             CHOICE {
rnReconfiguration-r10 RNReconfiguration-r10-IEs,
         c1
             spare3 NULL, spare2 NULL, spare1 NULL
         },
         criticalExtensionsFuture
                                        SEQUENCE { }
    }
}
RNReconfiguration-r10-IEs ::=
rn-SystemInfo-r10
rn-SubframeConfig-r10
lateNonCriticalExtension
nonCriticalExtension
                                       SEQUENCE {

RN-SystemInfo-r10 OPTIONAL,

RN-SubframeConfig-r10 OPTIONAL,

OPTIONAL,
                                      SEQUENCE {
                                                                                                -- Need ON
                                                                                                -- Need ON
                                        OCTET STRING
                                                                                 OPTIONAL,
    nonCriticalExtension
                                            SEQUENCE { }
                                                                                  OPTIONAL
}
RN-SystemInfo-r10 ::= SEQUENCE {
    systemInformationBlockTypel-r10 OCTET STRING (CONTAINING SystemInformationBlockTypel)
    OPTIONAL, -- Need ON
    systemInformationBlockType2-r10 SystemInformationBlockType2
                                                                                OPTIONAL, -- Need ON
     . . .
}
-- ASN1STOP
```

RNReconfigurationComplete

The RNReconfigurationComplete message is used to confirm the successful completion of an RN reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: RN to E-UTRAN

RNReconfigurationComplete message

```
-- ASN1START
```

```
SEQUENCE {
RNReconfigurationComplete-r10 ::=
   rrc-TransactionIdentifier
                                          RRC-TransactionIdentifier,
   criticalExtensions
                                           CHOICE {
           rnReconfigurationComplete-r10 CHOICE {
       c1
                                                   RNReconfigurationComplete-r10-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
       }
       criticalExtensionsFuture
                                               SEQUENCE { }
   }
}
RNReconfigurationComplete-r10-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                          OCTET STRING
                                                                      OPTIONAL,
                                           SEQUENCE { }
                                                                      OPTIONAL
   nonCriticalExtension
}
-- ASN1STOP
```

RRCConnectionReconfiguration

The *RRCConnectionReconfiguration* message is the command to modify an RRC connection. It may convey information for measurement configuration, mobility control, radio resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information and security configuration.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: E-UTRAN to UE

RRCConnectionReconfiguration message

```
RRCConnectionReconfiguration ::=
                                   SEQUENCE {
    rrc-TransactionIdentifier
                                       RRC-TransactionIdentifier,
    criticalExtensions
                                       CHOICE {
       c1
                                            CHOICE {
           rrcConnectionReconfiguration-r8
                                               RRCConnectionReconfiguration-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                           SEQUENCE { }
    }
}
RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {
                                       MeasConfig
                                                                       OPTIONAL,
    measConfig
                                                                                    -- Need ON
    mobilityControlInfo
                                       MobilityControlInfo
                                                                       OPTIONAL,
                                                                                    -- Cond HO
    dedicatedInfoNASList
                                       SEQUENCE (SIZE(1..maxDRB)) OF
                                            DedicatedInfoNAS
                                                                       OPTIONAL, -- Cond nonHO
```

```
radioResourceConfigDedicated RadioResourceConfigDedicated OPTIONAL, -- Cond HO-toEUTRA
                                                                        OPTIONAL, -- Cond HO-toEPC
    securityConfigHO
                                        SecurityConfigHO
   nonCriticalExtension
                                       RRCConnectionReconfiguration-v890-IEs OPTIONAL
}
RRCConnectionReconfiguration-v890-IEs ::= SEQUENCE {
   lateNonCriticalExtension
                                      OCTET STRING (CONTAINING RRCConnectionReconfiguration-v8m0-
IES) OPTIONAL,
  nonCriticalExtension
                                       RRCConnectionReconfiguration-v920-IEs OPTIONAL
}
-- Late non-critical extensions:
RRCConnectionReconfiguration-v8m0-IEs ::= SEQUENCE {
    -- Following field is only for pre REL-10 late non-critical extensions
    lateNonCriticalExtension OCTET STRING
                                                                                    OPTIONAL,
   nonCriticalExtension
                                       RRCConnectionReconfiguration-v10i0-IEs OPTIONAL
}
RRCConnectionReconfiguration-v10i0-IEs ::= SEQUENCE {
    antennaInfoDedicatedPCell-v10i0 AntennaInfoDedicated-v10i0
                                                                   OPTIONAL,
                                                                                -- Need ON
                                       RRCConnectionReconfiguration-v1010-IEs
    nonCriticalExtension
                                                                                   OPTIONAL
}
RRCConnectionReconfiguration-v10l0-IEs ::= SEQUENCE {
                                   MobilityControlInfo-v1010 OPTIONAL,
SCellToAddModList-v1010 OPTIONAL, -- Need ON
   mobilityControlInfo-v1010
sCellToAddModList-v1010 5
    -- Following field is only for late non-critical extensions from REL-10 to REL-11
    lateNonCriticalExtension
                                       OCTET STRING
                                                                            OPTIONAL,
                                       RRCConnectionReconfiguration-v12f0-IEs OPTIONAL
   nonCriticalExtension
}
RRCConnectionReconfiguration-v12f0-IEs ::= SEQUENCE {
   scg-Configuration-v12f0 SCG-Configuration-v12f0 OPTIONAL,
                                                                           -- Cond nonFullConfig
    -- Following field is only for late non-critical extensions from REL-12
                                                                        OPTIONAL,
    lateNonCriticalExtension OCTET STRING
    nonCriticalExtension
                                       RRCConnectionReconfiguration-v1370-IEs
                                                                                    OPTIONAL
}
RRCConnectionReconfiguration-v1370-IEs ::= SEQUENCE {
    radioResourceConfigDedicated-v1370 RadioResourceConfigDedicated-v1370 OPTIONAL, -- Need ON
    sCellToAddModListExt-v1370 SCellToAddModListExt-v1370 OPTIONAL, -- Need ON
                                           RRCConnectionReconfiguration-v13c0-IEs OPTIONAL
   nonCriticalExtension
}
RRCConnectionReconfiguration-v13c0-IEs ::= SEQUENCE {
   radioResourceConfigDedicated-v13c0 RadioResourceConfigDedicated-v13c0 OPTIONAL, -- Need ON
                                       SCellToAddModList-v13c0 OPTIONAL, -- Need ON
    sCellToAddModList-v13c0
   sCellToAddModList-v13c0SCellToAddModList-v13c0OPTIONAL,sCellToAddModListExt-v13c0SCellToAddModListExt-v13c0OPTIONAL,scg-Configuration-v13c0SCG-Configuration-v13c0OPTIONAL,
                                                                                -- Need ON
                                                                               -- Need ON
    -- Following field is only for late non-critical extensions from REL-13 onwards
                                           SEQUENCE { }
   nonCriticalExtension
                                                                       OPTTONAL.
}
-- Regular non-critical extensions:
RRCConnectionReconfiguration-v920-IEs ::= SEQUENCE {
                                        ENUMERATED {true}
                                                                               -- Need ON
    otherConfig-r9
                                       OtherConfig-r9
                                                                   OPTIONAL,
                                                                                -- Cond HO-Reestab
    fullConfig-r9
                                                                   OPTIONAL,
                                        RRCConnectionReconfiguration-v1020-IEs OPTIONAL
   nonCriticalExtension
}
RRCConnectionReconfiguration-v1020-IEs ::= SEQUENCE {
   SCellToReleaseList-r10SCellToReleaseList-r10OPTIONAL,SCellToAddModList-r10SCellToAddModList-r10O
                                                                              -- Need ON
                                                                           OPTIONAL, -- Need ON
   nonCriticalExtension
                                       RRCConnectionReconfiguration-v1130-IEs OPTIONAL
}
RRCConnectionReconfiguration-v1130-IEs ::= SEQUENCE {
   systemInformationBlockTypelDedicated-r11 OCTET STRING (CONTAINING
SystemInformationBlockType1)
   OPTIONAL, -- Need ON
   nonCriticalExtension
                                       RRCConnectionReconfiguration-v1250-IEs OPTIONAL
}
RRCConnectionReconfiguration-v1250-IEs ::= SEQUENCE {
    wlan-OffloadInfo-r12
                                        CHOICE {
       release
                                            NULL.
                                                SEQUENCE {
        setup
           wlan-OffloadConfigDedicated-r12
                                               WLAN-OffloadConfig-r12,
```

t350-r12 }	ENUMERATED {min5, min120, min180, spare1	min10, min20, min30, min60, } OPTIONAL Need OR
} scg-Configuration-r12	SCG-Configuration-r12 OP	OPTIONAL, Need ON TIONAL, Cond
<pre>nonFullConfig sl-SyncTxControl-r12 sl-DiscConfig-r12 sl-CommConfig-r12 nonCriticalExtension</pre>	SL-SyncTxControl-r12 SL-DiscConfig-r12 SL-CommConfig-r12 RRCConnectionReconfiguration-v	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON 1310-IEs OPTIONAL
}		
<pre>RRCConnectionReconfiguration-v1310-I sCellToReleaseListExt-r13 lwa-Configuration-r13 lwip-Configuration-r13 rclwi-Configuration-r13 nonCriticalExtension OPTIONAL }</pre>	Es ::= SEQUENCE { SCellToReleaseListExt-r13 SCellToAddModListExt-r13 LWA-Configuration-r13 LWIP-Configuration-r13 RCLWI-Configuration-r13 RRCConnectionReconfiguration-v	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON 1430-IES
sCellToAddModListExt-v1430 perCC-GapIndicationRequest-r14 systemInformationBlockType2Dedic SystemInformationBlockType2)	SL-V2X-ConfigDedicated-r14 OP SCellToAddModListExt-v1430 OP	OPTIONAL, Cond nonHO
RRCConnectionReconfiguration-v1510-I nr-Config-r15 release setup endc-ReleaseAndAdd-r15	CHOICE { NULL, SEQUENCE {	
nr-SecondaryCellGroupCon p-MaxEUTRA-r15 }		OPTIONAL, Need ON OPTIONAL Need ON
<pre>} } sk-Counter-r15 nr-RadioBearerConfig1-r15 nr-RadioBearerConfig2-r15 tdm-PatternConfig-r15 nonCriticalExtension }</pre>	INTEGER (0 65535) OCTET STRING OCTET STRING TDM-PatternConfig-r15 OP RRCConnectionReconfiguration-v1530	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON TIONAL, Cond FDD-PCell -IES OPTIONAL
RRCConnectionReconfiguration-v1530-I	Es ::= SEQUENCE {	
securityConfigHO-v1530	SecurityConfigHO-v1530	OPTIONAL, Cond HO-5GC
sCellGroupToReleaseList-r15 sCellGroupToAddModList-r15 dedicatedInfoNASList-r15	SCellGroupToReleaseList-r15 SCellGroupToAddModList-r15 SEQUENCE (SIZE(1maxDRB-r15)) OF	OPTIONAL, Need ON OPTIONAL, Need ON
p-MaxUE-FR1-r15	DedicatedInfoNAS P-Max	OPTIONAL, Cond nonHO OPTIONAL, Need OR
smtc-r15	MTC-SSB-NR-r15	OPTIONAL, Need OP
<pre>nonCriticalExtension }</pre>	SEQUENCE {}	OPTIONAL
<pre>SL-SyncTxControl-r12 ::= networkControlledSyncTx-r12 }</pre>	SEQUENCE { ENUMERATED {on, off}	OPTIONAL Need OP
PSCellToAddMod-r12 ::= sCellIndex-r12 cellIdentification-r12 physCellId-r12 dl-CarrierFreq-r12	SEQUENCE { SCellIndex-r10, SEQUENCE { PhysCellId, ARFCN-ValueEUTRA-r9	
} radioResourceConfigCommonPSCell-	r12 RadioResourceConfigCommonP	OPTIONAL, Cond SCellAdd SCell-r12 OPTIONAL, Cond
SCellAdd radioResourceConfigDedicatedPSCe Cond SCellAdd2	ll-r12 RadioResourceConfigDedicat	edPSCell-r12 OPTIONAL,
[[antennaInfoDedicatedPSCell-v	1280 AntennaInfoDedicated-v	10i0 OPTIONAL Need ON
]], [[sCellIndex-r13]],	SCellIndex-r13 OPTIONAL	Need ON

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```
[[ radioResourceConfigDedicatedPSCell-v1370 RadioResourceConfigDedicatedPSCell-v1370
   OPTIONAL
             -- Need ON
   ]],
   [[ radioResourceConfigDedicatedPSCell-v13c0 RadioResourceConfigDedicatedPSCell-v13c0
   OPTIONAL -- Need ON
   11
}
PSCellToAddMod-v12f0 ::=
                                      SEQUENCE {
   radioResourceConfigCommonPSCell-r12 RadioResourceConfigCommonPSCell-v12f0
                                                                                 OPTIONAL
}
PSCellToAddMod-v1440 ::=
                                      SEQUENCE {
   radioResourceConfigCommonPSCell-r14
                                       RadioResourceConfigCommonPSCell-v1440 OPTIONAL
}
PowerCoordinationInfo-r12 ::= SEQUENCE {
   p-MeNB-r12
                                      INTEGER (1..16),
   p-SeNB-r12
                                      INTEGER (1..16),
   powerControlMode-r12
                                      INTEGER (1..2)
}
SCellToAddModList-r10 ::=
                             SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-r10
SCellToAddModList-v1010 ::=
                              SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-v1010
SCellToAddModList-v13c0 ::=
                              SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellToAddMod-v13c0
SCellToAddModListExt-r13 ::=
                              SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddModExt-r13
SCellToAddModListExt-v1370 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddModExt-v1370
SCellToAddModListExt-v13c0 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddMod-v13c0
SCellToAddModListExt-v1430 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellToAddModExt-v1430
SCellGroupToAddModList-r15 ::= SEQUENCE (SIZE (1..maxSCellGroups-r15)) OF SCellGroupToAddMod-r15
                              SEQUENCE {
SCellToAddMod-r10 ::=
   sCellIndex-r10
                                      SCellIndex-r10,
   cellIdentification-r10
                                      SEQUENCE {
       physCellId-r10
                                          PhysCellId.
       dl-CarrierFreq-r10
                                          ARFCN-ValueEUTRA
                                                                 OPTIONAL, -- Cond SCellAdd
   }
   radioResourceConfigCommonSCell-r10
                                        RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Cond
SCellAdd
   radioResourceConfigDedicatedSCell-r10 RadioResourceConfigDedicatedSCell-r10 OPTIONAL,
Cond SCellAdd2
   [[ dl-CarrierFreq-v1090
                                          ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Cond EARFCN-max
   ]],
   [[ antennaInfoDedicatedSCell-v10i0
                                          AntennaInfoDedicated-v10i0 OPTIONAL
                                                                                 -- Need ON
   ]],
   [[ srs-SwitchFromServCellIndex-r14
                                          INTEGER (0.. 31) OPTIONAL -- Need ON
    ]]
   [[ sCellState-r15
                                          ENUMERATED {activated, dormant} OPTIONAL -- Need ON
   ]]
}
SCellToAddMod-v1010 ::=
                              SEOUENCE {
   radioResourceConfigCommonSCell-v1010
                                              RadioResourceConfigCommonSCell-v1010
                                                                                    OPTIONAL
}
SCellToAddMod-v13c0 ::=
                              SEOUENCE {
  radioResourceConfigDedicatedSCell-v13c0 RadioResourceConfigDedicatedSCell-v13c0 OPTIONAL
}
SCellToAddModExt-r13 ::=
                                  SEQUENCE {
   sCellIndex-r13
                                      SCellIndex-r13,
   cellIdentification-r13
                                      SEQUENCE {
       physCellId-r13
                                         PhysCellId,
       dl-CarrierFreq-r13
                                          ARFCN-ValueEUTRA-r9
                                                                 OPTIONAL,
                                                                             -- Cond SCellAdd
   }
                                        RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Cond
   radioResourceConfigCommonSCell-r13
SCellAdd
   radioResourceConfigDedicatedSCell-r13 RadioResourceConfigDedicatedSCell-r10 OPTIONAL,
Cond SCellAdd2
   antennaInfoDedicatedSCell-r13 AntennaInfoDedicated-v10i0 OPTIONAL -- Need ON
```

}

```
SEQUENCE {
SCellToAddModExt-v1370 ::=
   radioResourceConfigCommonSCell-v1370
                                             RadioResourceConfigCommonSCell-v1010 OPTIONAL
}
SCellToAddModExt-v1430 ::=
                                 SEQUENCE {
                                   INTEGER (0.. 31) OPTIONAL, -- Need ON
   srs-SwitchFromServCellIndex-r14
    [[
       sCellState-r15
                                      ENUMERATED {activated, dormant}
                                                                       OPTIONAL -- Need ON
   ]]
}
SCellGroupToAddMod-r15 ::=
                                 SEQUENCE {
                                  SCellGroupIndex-r15,
   sCellGroupIndex-r15
   sCellConfigCommon-r15
                                      SCellConfigCommon-r15
                                                                    OPTIONAL,
                                                                                -- Need ON
                                                                    OPTIONAL,
   sCellToReleaseList-r15
                                     SCellToReleaseListExt-r13
                                                                                -- Need ON
   sCellToAddModList-r15
                                     SCellToAddModListExt-r13
                                                                    OPTIONAL
                                                                                -- Need ON
}
SCellToReleaseList-r10 ::=
                                 SEQUENCE (SIZE (1..maxSCell-r10)) OF SCellIndex-r10
SCellToReleaseListExt-r13 ::=
                                    SEQUENCE (SIZE (1..maxSCell-r13)) OF SCellIndex-r13
SCellGroupToReleaseList-r15 ::=
                                    SEQUENCE (SIZE (1..maxSCellGroups-r15)) OF SCellGroupIndex-
r15
SCellGroupIndex-r15 ::= INTEGER (1..maxSCellGroups-r15)
SCellConfigCommon-r15 ::= SEQUENCE {
   radioResourceConfigCommonSCell-r15
                                        RadioResourceConfigCommonSCell-r10 OPTIONAL, -- Need
ON
   radioResourceConfigDedicatedSCell-r15 RadioResourceConfigDedicatedSCell-r10 OPTIONAL, -- Need
ON
   antennaInfoDedicatedSCell-r15
                                         AntennaInfoDedicated-v10i0
                                                                       OPTIONAL -- Need ON
}
SCG-Configuration-r12 ::=
                                 CHOICE {
   release
                                     NULL,
                                      SEQUENCE {
   setup
                                    SEQUENCE {
       scg-ConfigPartMCG-r12
           powerCoordinationInfo-r12 PowerCoordinationInfo-r12 FowerCoordinationInfo-r12
                                                                       OPTIONAL.
                                                                                    -- Need ON
          scg-Counter-r12
                                             PowerCoordinationInfo-r12 OPTIONAL, -- Need ON
                                                                     OPTIONAL,
                                                                                -- Need ON
       scg-ConfigPartSCG-r12
                                        SCG-ConfigPartSCG-r12
                                                                    OPTIONAL
                                                                                -- Need ON
   }
}
SCG-Configuration-v12f0 ::=
                                CHOICE {
   release
                                      NULL,
   setup
                                      SEOUENCE {
       scg-ConfigPartSCG-v12f0
                                         SCG-ConfigPartSCG-v12f0 OPTIONAL
                                                                                -- Need ON
}
SCG-Configuration-v13c0 ::=
                                  CHOICE {
   release
                                    NULL,
   setup
                                      SEQUENCE {
                                         SCG-ConfigPartSCG-v13c0 OPTIONAL -- Need ON
       scg-ConfigPartSCG-v13c0
   }
}
                                  SEQUENCE {
SCG-ConfigPartSCG-r12 ::=
   radioResourceConfigDedicatedSCG-r12 RadioResourceConfigDedicatedSCG-r12 OPTIONAL,
                                                                                   -- Need ON
   sCellToReleaseListSCG-r12 SCellToReleaseList-r10 OPTIONAL, -- Need ON
                                                                OPTIONAL,
                                                                             -- Need ON
   pSCellToAddMod-r12
                                     SCellToAddModList-r10
                                     PSCellToAddMod-r12
   sCellToAddModListSCG-r12
                                                                OPTIONAL,
                                                                            -- Need ON
   sCellToAddModListSCG-r12 SCellToAddModList-r10 OPTIONAL,
mobilityControlInfoSCG-r12 MobilityControlInfoSCG-r12 OPTIONAL,
                                                                           -- Need ON
    . . . ,
   ]]
   sCellToReleaseListSCG-Ext-r13
                                         SCellToReleaseListExt-r13
                                                                        OPTIONAL,
                                                                                    -- Need ON
   sCellToAddModListSCG-Ext-r13
                                         SCellToAddModListExt-r13
                                                                                    -- Need ON
                                                                        OPTIONAL
   ]],
   [[
   sCellToAddModListSCG-Ext-v1370 SCellToAddModListExt-v1370 OPTIONAL -- Need ON
    ]],
   [[
```

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pSCellToAddMod-v1440 PSCellToAddMod-v1440 OPTIONAL -- Need ON 11, [sCellGroupToReleaseListSCG-r15 SCellGroupToReleaseList-r15 OPTIONAL, -- Need ON sCellGroupToAddModListSCG-r15 SCellGroupToAddModList-r15 OPTIONAL -- Need ON]], [[-- NE-DC addition for setup/ modification and release SN configured measurements MeasConfig OPTIONAL, measConfigSN-r15 -- Need ON -- NE-DC additions concerning DRBs/ SRBs are within RadioResourceConfigDedicatedSCG -- Cond FDDtdm-PatternConfigNE-DC-r15 TDM-PatternConfig-r15 OPTIONAL PSCell]], [[p-MaxEUTRA-r15 P-Max OPTIONAL -- Need ON 11 } SCG-ConfigPartSCG-v12f0 ::= SEQUENCE { PSCellToAddMod-v12f0 OPTIONAL, SCellToAddModList-v1010 OPTIONAL pSCellToAddMod-v12f0 -- Need ON sCellToAddModListSCG-v12f0 -- Need ON } sCellToAddModListSCG-v13c0 SCellTo SCG-ConfigPartSCG-v13c0 ::= sCellToAddModListSCG-v13c0SCellToAddModList-v13c0OPTIONAL,sCellToAddModListSCG-Ext-v13c0SCellToAddModListExt-v13c0OPTIONAL -- Need ON -- Need ON } SEQUENCE { SecurityConfigHO ::= handoverType CHOICE { SEQUENCE { intraLTE SecurityAlgorithmConfig OPTIONAL, -- Cond securityAlgorithmConfig fullConfig keyChangeIndicator BOOLEAN. nextHopChainingCount NextHopChainingCount }, interRAT SEQUENCE { erRAT securityAlgorithmConfig nas-SecurityParamToEUTRA SecurityAlgorithmConfig, OCTET STRING (SIZE(6)) } }, } SecurityConfigHO-v1530 ::= SEOUENCE { handoverType-v1530 CHOICE { SEQUENCE { intra5GC-r15 securityAlgorithmConfig-r15 SecurityAlgorithmConfig OPTIONAL, -- Cond HOtoEUTRA keyChangeIndicator-r15 BOOLEAN. nextHopChainingCount-r15 NextHopChainingCount, nas-Container-r15 OCTET STRING OPTIONAL -- Need ON SEQUENCE { fivegc-ToEPC-r15 securityAlgorithmConfig-r15 SecurityAlgorithmConfig, nextHopChainingCount-r15 NextHopChainingCount }, SEQUENCE { epc-To5GC-r15 securityAlgorithmConfig-r15 SecurityAlgorithmConfig, nas-Container-r15 OCTET STRING } }, } TDM-PatternConfig-r15 ::= CHOICE { NULL. release SEQUENCE { setup SubframeAssignment-r15, subframeAssignment-r15 harq-Offset-r15 INTEGER (0.. 9) } }

```
-- ASN1STOP
```

RRCConnectionReconfiguration field descriptions	
<i>dedicatedInfoNASList</i> This field is used to transfer UE specific NAS layer information between the network and	the LIF. The PPC lover is
transparent for each PDU in the list. If <i>dedicatedInfoNASList-r15</i> is present, UE shall igno (without suffix).	
endc-ReleaseAndAdd	
A one-shot field indicating whether the UE simultaneously releases and adds all the NR 3	SCC related configuration
within nr-Config, i.e. the configuration set by the NR RRCReconfiguration message (e.g.	
and measConfig).	
<i>fullConfig</i> Indicates the full configuration option is applicable for the RRC Connection Reconfigurati intra-RAT handover. For inter-RAT handover from NR to E-UTRA, <i>fullConfig</i> indicates whether the second seco	hether or not delta signalling
of SDAP/PDCP from source RAT is applicable. This field is absent when the <i>RRCConne</i> message is generated by the E-UTRA SCG.	ectionReconfiguration
harq-Offset	be encoded aubrome
Indicates a HARQ subframe offset that is applied to the subframes designated as UL in t assignment, see TS 36.213 [23].	
keyChangeIndicator	
If UE is connected to EPC, true is used only in an intra-cell handover when a K_{eNB} key is taken into use through the latest successful NAS SMC procedure, as described in TS 33 false is used in an intra-LTE handover when the new K_{eNB} key is obtained from the curre described in TS 33.401 [32].	.401 [32] for K _{eNB} re-keying.
If UE is connected to 5GC, with keyChangeIndicator-r15, true is used in an intra-cell han derived from a K_{AMF} key taken into use through the latest successful NAS SMC procedur [86] for K_{eNB} re-keying.	
False is used for intra-system handover when the new K_{eNB} key is obtained from the curr as described in TS 33.501 [86]. True is also used in NG based handover procedure with key is derived from the new K_{AMF} key as described in TS 33.501 [86].	
<i>Iwa-Configuration</i> This field is used to provide parameters for LWA configuration. E-UTRAN does not simul DC, LWIP or RCLWI for a UE.	taneously configure LWA wit
Iwip-Configuration	
This field is used to provide parameters for LWIP configuration. E-UTRAN does not simu with DC, LWA or RCLWI for a UE.	Itaneously configure LWIP
measConfig	
Measurements that E-UTRAN may configure when the UE is not configured with NE-DC.	•
measConfigSN Measurements that E-UTRAN may configure when the UE is configured with NE-DC and within an NR RRC message.	d for which reports are carried
nas-Container This field is used to transfer UE specific NAS layer information between the network and transparent for this field, although, if included, it affects activation of AS- security after ha The content is defined in TS 24.501 [95]. In case of NG based handover, the content of r mode NAS transparent container IE. In case of inter-system handover to from 5GS to EF Container is. the S1 mode to N1 mode NAS transparent container IE.	ndover within E-UTRA/5GC. nas-Container is. the Intra N1
nas-securityParamToEUTRA	
This field is used to transfer UE specific NAS layer information between the network and transparent for this field, although, if included, it affects activation of AS- security after int UTRA/EPC or inter-system handover to E-UTRA/EPC. The content is defined in TS 24.3 for handover from 5GC.	er-RAT handover to E-
networkControlledSyncTx This field indicates whether the UE shall transmit synchronisation information (i.e. becom Value <i>On</i> indicates the UE to transmit synchronisation information while value <i>Off</i> indicat such information.	
nextHopChainingCount	IF is connected to ECC
Parameter NCC: See TS 33.401 [32] if UE is connected to EPC, else see 33.501 [86] if L nr-Config	
Includes the NR related configurations. This field is used to configure (NG)EN-DC config conjunction with fields <i>sk-Counter</i> and <i>nr-RadioBearerConfig1/2</i> . NOTE 1.	uration, possibly in
nr-RadioBearerConfig1, nr-RadioBearerConfig2 Includes the NR RadioBearerConfig IE as specified in TS 38.331 [82]. The field includes configured with NR PDCP.	the configuration of RBs
<i>nr-SecondaryCellGroupConfig</i> Includes the NR <i>RRCReconfiguration</i> message as specified in TS 38.331 [82]. In this ver	
NR RRC message only includes fields <i>secondaryCellGroup</i> and/ or <i>measConfig</i> . If <i>nr-Se</i> configured, the network always includes this field upon MN handover to initiate an NR SC	

	configuration field descriptions
perCC-GapIndicationRequest	
Indicates that UE shall include perCC-GapIndicationL	
	numFreqEffectiveReduced may also be included if frequencies
are configured for reduced measurement performanc	е.
p-MaxEUTRA	
Indicates the maximum power available for LTE.	
p-MaxUE-FR1	
The maximum total transmit power to be used by the	UE across all serving cells in frequency range 1 (FR1) across all
cell groups. The maximum transmit power that the UF	E may use may be additionally limited on cell- or cell-group level.
The field is optionally present, if (NG)EN-DC (nr-Cont	ig-r15) has been configured. It is absent otherwise.
p-MeNB	• · •
	cified in TS 36.213 [23]. The value N corresponds to N-1 in TS
36.213 [23].	
powerControlMode	
	1 corresponds to DC power control mode 1 and value 2 indicates
DC power control mode 2, as specified in TS 36.213	
p-SeNB	[-0].
Indicates the guaranteed power for the SeNB as spec	sified in TS 36 213 [23] Table 5.1.4.2-1. The value N
corresponds to N-1 in TS 36.213 [23].	silied in 10 50.215 [25], Table 5.1.4.2-1. The value N
<i>rclwi-Configuration</i>	5.2. E-UTRAN does not simultaneously configure RCLWI with
	5.2. E-OTRAN QUES NOT SIMULANEOUSIY CONIIGULE ROLWI WITH
DC, LWA or LWIP for a UE.	
sCellConfigCommon	
Indicates the common configuration for the SCell group	Jp.
sCellGroupIndex	<i>n</i>
Indicates the identity of SCell groups for which a com	mon configuration is provided.
sCellIndex	
	ope of the UE i.e. an SCG cell can not use the same value as
	ndex-r13 is present the UE shall ignore sCellIndex-r12.
	t have same values as sCellIndex-r10 in sCellToAddModList-r10.
sCellGroupToAddModList, sCellGroupToAddMod	
Indicates the SCell group to be added or modified. E-	UTRAN only configures at most 4 SCell groups per UE over all
cell groups. SCell groups can only be configured for I	TE SCells, and all SCells in an SCell group must belong to the
same cell group.	
sCellGroupToReleaseList	
Indicates the SCell group to be released.	
sCellState	
A one-shot field that indicates whether the SCell shal	be considered to be in activated or dormant state upon SCell
configuration.	······································
sCellToAddModList, sCellToAddModListExt	
	ellToAddModList is used to add the first 4 SCells for a UE with
	o add the rest. If E-UTRAN includes sCellToAddModListExt-
	ted in the same order, as in <i>sCellToAddModListExt-r13</i> . If E-
	s the same number of entries, and listed in the same order, as in
	oAddModListExt-v1370 it includes the same number of entries,
	stExt-r13. If E-UTRAN includes sCellToAddModListExt-v13c0 it
includes the same number of entries, and listed in the	
sCellToAddModListSCG, sCellToAddModListSCG	
	ield is used for SCG cells other than the PSCell (which is added/
	dModListSCG is used to add the first 4 SCells for a UE with
sCellIndex-r10 while sCellToAddModListSCG-Ext is u	
sCellToAddModListSCG-v10l0 it includes the same n	
	CellToAddModListSCG-Ext-v1370 it includes the same number o
entries, and listed in the same order, as in sCellToAa	
sCellToAddModListSCG-Ext-v13c0 it includes the sa	me number of entries, and listed in the same order, as in
sCellToAddModListSCG-Ext-r13.	
sCellToReleaseListSCG, sCellToReleaseListSCG-	Ext
	o used to release the PSCell e.g. upon change of PSCell, upon
system information change for the PSCell.	
scg-Configuration	
	and NE-DC. When the UE is configured with NE-DC, E-UTRAN
neither applies value release nor configures scg-Con	
scg-Counter	
	urity as well as upon refresh of S-KeNB. E-UTRAN includes the
	any as well as upon renesh of S-ReNB. E-OTRAIN INCIDDES LITE
	s are configured. Otherwise E-UTRAN does not include the field.

RRCConnectionReconfiguration field descriptions

securityConfigHO

This field contains the parameters required to update the security keys at handover. If E-UTRAN includes the *securityConfigHO* (i.e., without suffix), the choice *intraLTE* is used for handover within E-UTRA/EPC while the choice *interRAT* is used for handover from GERAN or UTRAN to E-UTRA/EPC. If E-UTRAN includes the *securityConfigHO*-*v1530* (i.e., with suffix), the choice *intra5GC* is used for handover from NR or E-UTRA/5GC to E-UTRA/5GC while the choice *fivegc-ToEPC* is used for inter-system handover from NR or E-UTRA/5GC.

sk-Counter

A one-shot counter used upon initial configuration of S-K_{gNB} as well as upon refresh of S-K_{gNB}. E-UTRAN provides this field upon configuring (NG)EN-DC, to facilitate configuration of SRB3, or upon configuring an (SN terminated) RB using S-K_{gNB}.

sl-V2X-ConfigDedicated

Indicates sidelink configuration for non-P2X related V2X sidelink communication as well as P2X related V2X sidelink communication.

smtc

The SSB periodicity/offset/duration configuration of target cell for NR PSCell addition and SN change. It is based on timing reference of EUTRA PCell. NOTE 2.

If the field is absent, the UE uses the SMTC in the *measObjectNR* having the same SSB frequency and subcarrier spacing, as configured before the reception of the RRC message.

srs-SwitchFromServCellIndex

Indicates the serving cell whose UL transmission may be interrupted during SRS transmission on a PUSCH-less cell. During SRS transmission on a PUSCH-less cell, the UE may temporarily suspend the UL transmission on a serving cell with PUSCH in the same CG to allow the PUSCH-less cell to transmit SRS. The PUSCH-less cell is always a TDD cell but the serving cell with PUSCH may be either a FDD or TDD cell.

subframeAssignment

Indicates DL/UL subframe configuration where sa0 points to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21], table 4.2-2.

systemInformationBlockType1Dedicated

This field is used to transfer SystemInformationBlockType1 or SystemInformationBlockType1-BR to the UE.

systemInformationBlockType2Dedicated

This field is used to transfer BR version of *SystemInformationBlockType2* to BL UEs or UEs in CE or *SystemInformationBlockType2* to non-BL UEs.

t350

Timer T350 as described in clause 7.3. Value *minN* corresponds to N minutes.

tdm-PatternConfig

UL/DL reference configuration indicating the time during which a UE configured with (NG)EN-DC is allowed to transmit. This field is used when power control or IMD issues require single UL transmission as specified in TS 38.101-3 [101] and TS 38.213 [88].

tdm-PatternConfigNE-DC

UL/DL reference configuration indicating the time during which a UE configured with NE-DC is allowed to transmit. This field is used when power control or IMD issues require single UL transmission as specified in TS 38.101-3 [101] and TS 38.213 [88].

Conditional presence	Explanation	
EARFCN-max	The field is mandatory present if <i>dl-CarrierFreq-r10</i> is included and set to <i>maxEARFCN</i> . Otherwise the field is not present.	
FDD-PCell	This field is optionally present, need ON, for a FDD PCell if there is no SCell with configured uplink. Otherwise, the field is not present.	
FDD-PSCell	This field is optionally present, need ON, for a FDD PSCell if there is no SCell with configured uplink. Otherwise, the field is not present.	
fullConfig	This field is mandatory present for handover within E-UTRA when the <i>fullConfig</i> is included; otherwise it is optionally present, Need OP.	
НО	The field is mandatory present in case of handover within E-UTRA or to E-UTRA; otherwise the field is not present.	
HO-Reestab	The field is mandatory present in case of inter-system handover within E-UTRA or handover from NR to E-UTRA/EPC; it is optionally present, need ON, in case of intra-system handover within E-UTRA or upon the first reconfiguration after RRC connection re-establishment; or for intra-system handover from NR to E-UTRA, otherwise the field is not present.	
HO-5GC	The field is mandatory present in case of handover within E-UTRA/5GC, handover to E-UTRA/5GC, handover from NR to E-UTRA/EPC, or handover from E-UTRA/5GC to E-UTRA/EPC, otherwise the field is not present.	
HO-toEPC	The field is mandatory present in case of handover within E-UTRA/EPC or to E-UTRA/EPC, except handover from NR or E-UTRA/5GC, otherwise the field is not present.	
HO-toEUTRA	The field is mandatory present in case of handover to E-UTRA or for reconfigurations when <i>fullConfig</i> is included; otherwise the field is optionally present, need ON.	
nonFullConfig	The field is not present when the <i>fullConfig</i> is included or in case of handover to E-UTRA; otherwise it is optional present, need ON.	
nonHO	The field is not present in case of handover within E-UTRA or to E-UTRA; otherwise it is optional present, need ON.	
SCellAdd	The field is mandatory present upon SCell addition; otherwise it is not present.	
SCellAdd2	The field is mandatory present upon SCell addition; otherwise it is optionally present, need ON.	

- NOTE 1: Fields *sk-Counter* and *nr-RadioBearerConfig1/2* are placed outside *nr-Config*, as these may be configured while the UE is not configured with (NG)EN-DC.
- NOTE 2: It is not specified whether the timing reference for the SMTC configuration is the source EUTRA PCell or the target EUTRA PCell in case the NR PSCell addition or SN change takes place simultaneously with handover. As a consequence, explicit SMTC configuration is only supported when the source EUTRA PCell and the target EUTRA PCell of the handover are SFN/subframe-synchronized.

RRCConnectionReconfigurationComplete

The *RRCConnectionReconfigurationComplete* message is used to confirm the successful completion of an RRC connection reconfiguration.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionReconfigurationComplete message

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}

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,			
<pre>RRCConnectionReconfigurationComplete-v8 lateNonCriticalExtension nonCriticalExtension }</pre>	a0-IEs ::= SEQUENCE { OCTET STRING RRCConnectionReconfigurationCom	OPTIONAL, plete-v1020-IEs	OPTIONAL
<pre>RRCConnectionReconfigurationComplete-v1 rlf-InfoAvailable-r10 logMeasAvailable-r10 nonCriticalExtension }</pre>	020-IES ::= SEQUENCE { ENUMERATED {true} ENUMERATED {true} RRCConnectionReconfigurationCom	OPTIONAL, OPTIONAL, plete-v1130-IEs	OPTIONAL
<pre>RRCConnectionReconfigurationComplete-v1 connEstFailInfoAvailable-r11 nonCriticalExtension }</pre>	130-IES ::= SEQUENCE { ENUMERATED {true} RRCConnectionReconfigurationCom	OPTIONAL, plete-v1250-IEs	OPTIONAL
<pre>RRCConnectionReconfigurationComplete-v1 logMeasAvailableMBSFN-r12 nonCriticalExtension OPTIONAL }</pre>	250-IES ::= SEQUENCE { ENUMERATED {true} RRCConnectionReconfigurationCom	OPTIONAL, plete-v1430-IEs	
<pre>RRCConnectionReconfigurationComplete-v1 perCC-GapIndicationList-r14 numFreqEffective-r14 numFreqEffectiveReduced-r14 nonCriticalExtension</pre>	430-IES ::= SEQUENCE { PerCC-GapIndicationList-r14 INTEGER (112) INTEGER (112) RRCConnectionReconfigurationCom	OPTIONAL, OPTIONAL, OPTIONAL, plete-v1510-IEs	
<pre>RRCConnectionReconfigurationComplete-v1 scg-ConfigResponseNR-r15 nonCriticalExtension</pre>	510-IES ::= SEQUENCE { OCTET STRING RRCConnectionReconfigurationCom	OPTIONAL, plete-v1530-IEs	
<pre>RRCConnectionReconfigurationComplete-vl logMeasAvailableBT-r15 logMeasAvailableWLAN-r15 flightPathInfoAvailable-r15 nonCriticalExtension }</pre>	530-IES ::= SEQUENCE { ENUMERATED {true} ENUMERATED {true} ENUMERATED {true} SEQUENCE {}	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	
A CATI CHIOD			

-- ASN1STOP

RRCConnectionReconfigurationComplete field descriptions

numFreqEffective

This field is used to indicate the number of effective frequencies that a UE measures in series according to TS 36.133 [16]. Simultaneous measurement in parallel on multiple frequencies can be equivalent to a single effective frequency. The frequencies configured for reduced measurement performance should not be included. *numFreqEffectiveReduced*This field is used to indicate the number of effective frequencies that a UE measures in series according to TS 36.133 [16] for frequencies configured for reduced measurement performance. Simultaneous measurement in parallel on multiple frequencies configured for reduced measurement performance.

perCC-GapIndicationList

This field is used to indicate per CC measurement gap preference by the UE.

scg-ConfigResponseNR

Includes the NR RRCReconfigurationComplete message as defined in TS 38.331 [82].

RRCConnectionReestablishment

The RRCConnectionReestablishment message is used to re-establish SRB1.

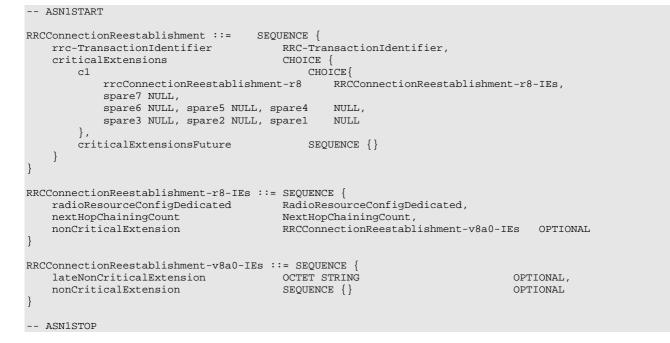
Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionReestablishment message



RRCConnectionReestablishmentComplete

The *RRCConnectionReestablishmentComplete* message is used to confirm the successful completion of an RRC connection re-establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

}

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionReestablishmentComplete message

```
-- ASN1START
RRCConnectionReestablishmentComplete ::= SEQUENCE {
   rrc-TransactionIdentifier
                                     RRC-TransactionIdentifier,
                                     CHOICE {
   criticalExtensions
       rrcConnectionReestablishmentComplete-r8
                                         RRCConnectionReestablishmentComplete-r8-IEs,
       criticalExtensionsFuture
                                         SEQUENCE { }
   }
}
RRCConnectionReestablishmentComplete-r8-IEs ::= SEQUENCE {
   nonCriticalExtension
                                   RRCConnectionReestablishmentComplete-v920-IEs OPTIONAL
}
RRCConnectionReestablishmentComplete-v920-IEs ::= SEQUENCE {
   rlf-InfoAvailable-r9
                                     ENUMERATED {true}
                                                                    OPTIONAL,
   nonCriticalExtension
                                     RRCConnectionReestablishmentComplete-v8a0-IEs
                                                                                  OPTIONAL
```

<pre>RRCConnectionReestablishmentComplete-v8 lateNonCriticalExtension nonCriticalExtension }</pre>	BaO-IES ::= SEQUENCE { OCTET STRING RRCConnectionReestablishmentCom	OPTIONAL, plete-v1020-IEs	OPTIONAL
RRCConnectionReestablishmentComplete-v1 logMeasAvailable-r10	.020-IEs ::= SEQUENCE { ENUMERATED {true}	OPTIONAL,	
<pre>nonCriticalExtension }</pre>	RRCConnectionReestablishmentCom	plete-v1130-IEs	OPTIONAL
RRCConnectionReestablishmentComplete-v1 connEstFailInfoAvailable-r11	130-IEs ::= SEQUENCE { ENUMERATED {true}		
nonCriticalExtension }	RRCConnectionReestablishmentCom	OPTIONAL, plete-v1250-IEs	OPTIONAL
RRCConnectionReestablishmentComplete-v1			
<pre>logMeasAvailableMBSFN-r12 nonCriticalExtension }</pre>	ENUMERATED {true} RRCConnectionReestablishmentCom	OPTIONAL, plete-v1530-IEs	OPTIONAL
RRCConnectionReestablishmentComplete-v1			
logMeasAvailableBT-r15 logMeasAvailableWLAN-r15	ENUMERATED {true} ENUMERATED {true}	OPTIONAL, OPTIONAL,	
flightPathInfoAvailable-r15 nonCriticalExtension	ENUMERATED {true}	OPTIONAL, OPTIONAL	
}	Sufference ()	OFIIONAL	
ASN1STOP			

RRCConnectionReestablishmentComplete field descriptions rlf-InfoAvailable This field is used to indicate the availability of radio link failure or handover failure related measurements

_

RRCConnectionReestablishmentReject

The *RRCConnectionReestablishmentReject* message is used to indicate the rejection of an RRC connection reestablishment request.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionReestablishmentReject message

```
-- ASN1START
RRCConnectionReestablishmentReject ::= SEQUENCE {
   criticalExtensions
                                      CHOICE {
       rrcConnectionReestablishmentReject-r8
                                          RRCConnectionReestablishmentReject-r8-IEs,
       criticalExtensionsFuture
                                          SEQUENCE { }
   }
}
RRCConnectionReestablishmentReject-r8-IEs ::= SEQUENCE {
   nonCriticalExtension
                                     RRCConnectionReestablishmentReject-v8a0-IEs OPTIONAL
}
RRCConnectionReestablishmentReject-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension OCTET STRING
                                                                          OPTIONAL,
   nonCriticalExtension
                                      SEQUENCE { }
                                                                          OPTIONAL
}
```

```
-- ASN1STOP
```

RRCConnectionReestablishmentRequest

The RRCConnectionReestablishmentRequest message is used to request the reestablishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

RRCConnectionReestablishmentRequest message

```
-- ASN1START
```

```
RRCConnectionReestablishmentRequest ::= SEQUENCE {
                                        CHOICE {
    criticalExtensions
        {\tt rrcConnectionReestablishmentRequest-r8}
                                             RRCConnectionReestablishmentRequest-r8-IEs,
        criticalExtensionsFuture
                                             SEQUENCE { }
    }
}
RRCConnectionReestablishmentRequest-r8-IEs ::= SEQUENCE {
   ue-Identity ReestabUE-Identity, reestablishmentCause ReestablishmentCause,
   ue-Identity
                                        BIT STRING (SIZE (2))
    spare
}
ReestabUE-Identity ::=
                                   SEQUENCE {
    c-RNTI
                                        C-RNTI,
    physCellId
                                         PhysCellId,
    shortMAC-I
                                         ShortMAC-I
}
ReestablishmentCause ::=
                                     ENUMERATED {
                                         reconfigurationFailure, handoverFailure,
                                         otherFailure, spare1
}
```

-- ASN1STOP

RRCConnectionReestablishmentRequest field descriptions

 physCellId

 The Physical Cell Identity of the PCell the UE was connected to prior to the failure.

 reestablishmentCause

 Indicates the failure cause that triggered the re-establishment procedure. eNB is not expected to reject a RRCConnectionReestablishmentRequest due to unknown cause value being used by the UE.

 ue-Identity

 UE identity included to retrieve UE context and to facilitate contention resolution by lower layers.

RRCConnectionReject

The RRCConnectionReject message is used to reject the RRC connection establishment or to reject the EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionReject message

-- ASN1START

RRCConnectionReject ::= SEQUE

SEQUENCE {

}	<pre>criticalExtensions c1 rrcConnectionReject-r8 spare3 NULL, spare2 NULI }, criticalExtensionsFuture }</pre>			
RR(CConnectionReject-r8-IEs ::= waitTime nonCriticalExtension	SEQUENCE { INTEGER (116), RRCConnectionReject-v8a0-IEs	OPTIONAL	
RRO }	CConnectionReject-v8a0-IEs ::= SEQ lateNonCriticalExtension nonCriticalExtension	QUENCE { OCTET STRING RRCConnectionReject-v1020-IES	OPTIONAL, OPTIONAL	
RR(CConnectionReject-v1020-IEs ::= extendedWaitTime-r10 nonCriticalExtension	SEQUENCE { INTEGER (11800) RRCConnectionReject-v1130-IEs	OPTIONAL, OPTIONAL	Need ON
RRO	CConnectionReject-v1130-IEs ::= deprioritisationReq-r11 deprioritisationType-r11 deprioritisationTimer-r11 } nonCriticalExtension OPTIONAL	<pre>SEQUENCE { SEQUENCE { ENUMERATED {frequency, e-utra}, ENUMERATED {min5, min10, min15, RRCConnectionReject-v1320-IEs</pre>	min30} OPTIONAL,	Need ON
}	CConnectionReject-v1320-IEs ::= rrc-SuspendIndication-r13 nonCriticalExtension ASN1STOP	SEQUENCE { ENUMERATED {true} SEQUENCE {}	OPTIONAL, OPTIONAL	Need ON

RRCConnectionReject field descriptions

deprioritisationReq
ndicates whether the current frequency or RAT is to be de-prioritised. The UE shall be able to store a depriotisation
equest for up to 8 frequencies (applicable when receiving another frequency specific deprioritisation request before
F325 expiry).
deprioritisationTimer
ndicates the period for which either the current carrier frequency or E-UTRA is deprioritised. Value <i>minN</i> corresponds
o N minutes.
extendedWaitTime
/alue in seconds for the wait time for Delay Tolerant access requests.
rc-SuspendIndication
f present, this field indicates that the UE should remain suspended and not release its stored context.
vaitTime
Nait time value in seconds.

RRCConnectionRelease

_

The *RRCConnectionRelease* message is used to command the release of an RRC connection, or to complete an UP-EDT procedure.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: E-UTRAN to UE

RRCConnectionRelease message

```
RRCConnectionRelease ::= SEQUENCE {
rrc-TransactionIdentifier RRC-TransactionIdentifier,
criticalExtensions CHOICE {
             rrcConnectionRelease-r8 PPCC
        c1
                                                  RRCConnectionRelease-r8-IEs,
         }.
                                              SEQUENCE { }
         criticalExtensionsFuture
    }
}
RRCConnectionRelease-r8-IEs ::= SEQUENCE {
    InterformediateInterformediatereleaseCauseReleaseCause,redirectedCarrierInfoRedirectedCarrierInfoidleModeMobilityControlInfoIdleModeMobilityControlInfononCriticalExtensionRRCConnectionRelease-v890-IES
                                                                                                 -- Need ON
                                                                                                 -- Need OP
    nonCriticalExtension
}
RRCConnectionRelease-v890-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING (CONTAINING RRCConnectionRelease-v9e0-IEs)
    OPTIONAL,
    nonCriticalExtension
                                           RRCConnectionRelease-v920-IEs
                                                                                  OPTIONAL
}
-- Late non critical extensions
RRCConnectionRelease-v9e0-IEs ::= SEQUENCE {
    redirectedCarrierInfo-v9e0 RedirectedCarrierInfo-v9e0
                                                                                  OPTIONAL,
                                                                                                 -- Cond
NoRedirect-r8
   idleModeMobilityControlInfo-v9e0 IdleModeMobilityControlInfo-v9e0 OPTIONAL,
                                                                                                -- Cond
IdleInfoEUTRA
    nonCriticalExtension
                                            SEQUENCE { }
                                                                                    OPTIONAL
}
-- Regular non critical extensions
RRCConnectionRelease-v920-IEs ::= SEQUENCE {
                       -
    cellInfoList-r9
                                           CHOICE {
                                             CellInfoListGERAN-r9,
        geran-r9
        utra-FDD-r9
                                                CellInfoListUTRA-FDD-r9,
        utra-TDD-r9
                                                CellInfoListUTRA-TDD-r9
         ...,
        utra-TDD-r10
                                              CellInfoListUTRA-TDD-r10
                                                                          OPTIONAL, -- Cond Redirection
    }
    nonCriticalExtension
                                          RRCConnectionRelease-v1020-IEs
                                                                                 OPTIONAL
}
RRCConnectionRelease-v1020-IEs ::= SEQUENCE {
                                           INTEGER (1..1800) OPTIONAL, -- Need ON
    extendedWaitTime-r10
    nonCriticalExtension
                                           RRCConnectionRelease-v1320-IEs
                                                                                             OPTIONAL
}
RRCConnectionRelease-v1320-IEs::= SEQUENCE {
                              ResumeIdentity-r13
    resumeIdentity-r13
                                                                               OPTIONAL,
                                                                                             -- Need OR
    nonCriticalExtension
                                           RRCConnectionRelease-v1530-IEs OPTIONAL
}
    nextHopChainingCount-r15 NextHopChaining
measIdleConfig_r15
RRCConnectionRelease-v1530-IEs ::= SEQUENCE {

        ENUMERATED {true}
        OPTIONAL, -- Cond UP-EDT

        NextHopChainingCount
        OPTIONAL, -- Cond UP-EDT

   measIdleConfig-r15MeasIdleConfigDedicated-r15OPTIONAL,--Need ONrrc-InactiveConfig-r15RRC-InactiveConfig-r15OPTIONAL,--Need ORcn-Type-r15ENUMERATED {epc,fivegc}OPTIONAL,--Need OR
    nonCriticalExtension
                                           RRCConnectionRelease-v1540-IEs
                                                                                        OPTIONAL
}
RRCConnectionRelease-v1540-IEs ::= SEQUENCE {
```

INTEGER (1..16) OPTIONAL, -- Cond 5GC waitTime SEQUENCE { } nonCriticalExtension OPTIONAL } ReleaseCause ::= ENUMERATED {loadBalancingTAUrequired, other, cs-FallbackHighPriority-v1020, rrc-Suspend-v1320} RedirectedCarrierInfo ::= CHOICE { eutra ARFCN-ValueEUTRA, geran CarrierFreqsGERAN, utra-FDD ARFCN-ValueUTRA, utra-TDD ARFCN-ValueUTRA, cdma2000-HRPD CarrierFreqCDMA2000, cdma2000-1xRTT CarrierFreqCDMA2000, . . . , utra-TDD-r10 CarrierFreqListUTRA-TDD-r10, CarrierInfoNR-r15 nr-r15 } RedirectedCarrierInfo-v9e0 ::= SEQUENCE { ARFCN-ValueEUTRA-v9e0 eutra-v9e0 } RRC-InactiveConfig-r15::= SEQUENCE { I-RNTI-r15, fullT-RNTT-r15 ShortI-RNTI-r15, shortI-RNTI-r15 ran-PagingCycle-r15 ENUMERATED { rf32, rf64, rf128, rf256} OPTIONAL, --Need OR ran-NotificationAreaInfo-r15RAN-NotificationAreaInfo-r15OPTIONAL,periodic-RNAU-timer-r15ENUMERATED {min5, min10, min20, min30, min60,
min120, min360, min720}OPTIONAL,nextHopChainingCount-r15NextHopChainingCountOPTIONAL, --Cond
SEQUENCE{} --Need ON --Need OR OPTIONAL, --Cond INACTIVE nonCriticalExtension SEQUENCE { } OPTIONAL } RAN-NotificationAreaInfo-r15 ::= CHOICE { cellList-r15 PLMN-RAN-AreaCellList-r15, PLMN-RAN-AreaConfigList-r15 ran-AreaConfigList-r15 } PLMN-RAN-AreaCellList-r15 ::= SEQUENCE (SIZE (1..maxPLMN-r15)) OF PLMN-RAN-AreaCell-r15 PLMN-RAN-AreaCell-r15 ::= SEQUENCE { PLMN-Identity OPTIONAL, plmn-Identity-r15 ran-AreaCells-r15 SEQUENCE (SIZE (1..32)) OF CellIdentity } PLMN-RAN-AreaConfigList-r15 ::= SEQUENCE (SIZE (1..maxPLMN-r15)) OF PLMN-RAN-AreaConfig-r15 PLMN-RAN-AreaConfig-r15 ::= SEQUENCE { plmn-Identity-r15 PLMN-Identity OPTIONAL, SEQUENCE (SIZE (1..16)) OF RAN-AreaConfig-r15 ran-Area-r15 } RAN-AreaConfig-r15 ::= SEQUENCE { trackingAreaCode-5GC-r15 TrackingAreaCode-5GC-r15, ran-AreaCodeList-r15 SEQUENCE (SIZE (1..32)) OF RAN-AreaCode-r15 OPTIONAL --Need OR } SEQUENCE (SIZE (1..maxFreqUTRA-TDD-r10)) OF ARFCN-ValueUTRA CarrierFreqListUTRA-TDD-r10 ::= IdleModeMobilityControlInfo ::= SEQUENCE { FreqPriorityListEUTRA freqPriorityListEUTRA OPTIONAL, -- Need ON FreqsPriorityListGERAN freqPriorityListGERAN FreqPriorityListUTRA-FDDOPTIONAL,FreqPriorityListUTRA-TDDOPTIONAL,BandClassPriorityListHRPDOPTIONAL,BandClassPriorityList1XRTTOPTIONAL,ENUMERATED { OPTIONAL, OPTIONAL, -- Need ON FreqPriorityListUTRA-FDD -- Need ON freqPriorityListUTRA-FDD freqPriorityListUTRA-TDD FreqPriorityListUTRA-TDD -- Need ON bandClassPriorityListHRPD -- Need ON bandClassPriorityList1XRTT -- Need ON t.320 min5, min10, min20, min30, min60, min120, min180, spare1} OPTIONAL, -- Need OR ...,
[[freqPriorityListExtEUTRA-r12 FreqPriorityListExtEUTRA-r12 OPTIONAL ___ Need ON]], FreqPriorityListEUTRA-v1310 [[freqPriorityListEUTRA-v1310 OPTIONAL, Need ON

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```
freqPriorityListExtEUTRA-v1310 FreqPriorityListExtEUTRA-v1310 OPTIONAL
                                                                                             ___
Need ON
   ]],
                                          FreqPriorityListNR-r15
   ]]]
       freqPriorityListNR-r15
                                                                   OPTIONAL
                                                                                    -- Need ON
    ]]
}
IdleModeMobilityControlInfo-v9e0 ::= SEQUENCE {
   freqPriorityListEUTRA-v9e0
                                      SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v9e0
}
FregPriorityListEUTRA ::=
                                SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA
FreqPriorityListExtEUTRA-r12 ::=
                                      SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-r12
                                      SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v1310
FregPriorityListEUTRA-v1310 ::=
FreqPriorityListExtEUTRA-v1310 ::=
                                     SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityEUTRA-v1310
                                  SEQUENCE {
FreqPriorityEUTRA ::=
                                      ARFCN-ValueEUTRA.
   carrierFreq
   cellReselectionPriority
                                      CellReselectionPriority
}
FreqPriorityEUTRA-v9e0 ::=
                                  SEQUENCE {
                                      ARFCN-ValueEUTRA-v9e0
                                                                OPTIONAL -- Cond EARFCN-max
   carrierFreq-v9e0
FreqPriorityEUTRA-r12 ::=
                                      SEQUENCE {
                                          ARFCN-ValueEUTRA-r9,
   carrierFreq-r12
   cellReselectionPriority-r12
                                          CellReselectionPriority
}
FreqPriorityEUTRA-v1310 ::=
                                     SEOUENCE {
   cellReselectionSubPriority-r13
                                              CellReselectionSubPriority-r13
                                                                                OPTIONAL
                                                                                               _ _
Need ON
}
FreqPriorityListNR-r15 ::=
                             SEQUENCE (SIZE (1..maxFreq)) OF FreqPriorityNR-r15
FreqPriorityNR-r15 ::=
                             SEQUENCE {
   cellReselectionPriority-r15 CellBesolect
   carrierFreg-r15
                                      CellReselectionPriority,
                                      CellReselectionSubPriority-r13
   cellReselectionSubPriority-r15
                                                                       OPTIONAL
                                                                                         -- Need
OR
}
FreqsPriorityListGERAN ::=
                                  SEQUENCE (SIZE (1..maxGNFG)) OF FreqsPriorityGERAN
FreqsPriorityGERAN ::=
                                  SEQUENCE {
                                      CarrierFreqsGERAN,
   carrierFregs
   cellReselectionPriority
                                      CellReselectionPriority
}
FreqPriorityListUTRA-FDD ::=
                                  SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF FreqPriorityUTRA-FDD
FreqPriorityUTRA-FDD ::=
                                  SEQUENCE {
                                     ARFCN-ValueUTRA,
   carrierFreq
   cellReselectionPriority
                                      CellReselectionPriority
}
FreqPriorityListUTRA-TDD ::=
                                  SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF FreqPriorityUTRA-TDD
                                  SEQUENCE {
FreqPriorityUTRA-TDD ::=
                                      ARFCN-ValueUTRA,
   carrierFreq
   cellReselectionPriority
                                      CellReselectionPriority
}
                                  SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassPriorityHRPD
BandClassPriorityListHRPD ::=
BandClassPriorityHRPD ::=
                                  SEOUENCE {
   bandClass
                                      BandclassCDMA2000,
                                      CellReselectionPriority
   cellReselectionPriority
}
BandClassPriorityList1XRTT ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassPriority1XRTT
BandClassPriority1XRTT ::= SEQUENCE {
```

```
bandClass
                                      BandclassCDMA2000,
   cellReselectionPriority
                                       CellReselectionPriority
}
CellInfoListGERAN-r9 ::=
                              SEQUENCE (SIZE (1..maxCellInfoGERAN-r9)) OF CellInfoGERAN-r9
CellInfoGERAN-r9 ::=
                                    SEOUENCE {
                                       PhysCellIdGERAN,
   physCellId-r9
   carrierFreq-r9
                                       CarrierFreqGERAN,
   systemInformation-r9
                                        SystemInfoListGERAN
}
CarrierInfoNR-r15 ::= SEQUENCE {
carrierFreq-r15
                                   ARFCN-ValueNR-r15,
    carrierFreq-r15ARFCN-ValueNR-r15,subcarrierSpacingSSB-r15ENUMERATED {kHz15, kHz30, kHz120, kHz240},smtc-r15MTC-SSB-NR-r15OPTIONAL
   smtc-r15
                                       MTC-SSB-NR-r15
                                                                   OPTIONAL
                                                                                    -- Need OP
}
CellInfoListUTRA-FDD-r9 ::=
                                   SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-FDD-r9
CellInfoUTRA-FDD-r9 ::=
                                   SEQUENCE {
   physCellId-r9
                                       PhysCellIdUTRA-FDD,
    utra-BCCH-Container-r9
                                        OCTET STRING
}
                                   SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-TDD-r9
CellInfoListUTRA-TDD-r9 ::=
CellInfoUTRA-TDD-r9 ::=
                                    SEQUENCE {
                                       PhysCellIdUTRA-TDD,
   physCellId-r9
    utra-BCCH-Container-r9
                                       OCTET STRING
}
CellInfoListUTRA-TDD-r10 ::=
                                   SEQUENCE (SIZE (1..maxCellInfoUTRA-r9)) OF CellInfoUTRA-TDD-r10
                              SEQUENCE {
CellInfoUTRA-TDD-r10 ::=
                                    PhysCellIdUTRA-TDD,
ARFCN-ValueUTRA,
  physCellId-r10
   carrierFreq-r10
   utra-BCCH-Container-r10
                                       OCTET STRING
}
```

-- ASN1STOP

RRCConnectionRelease field descriptions

carrierFreq or bandClass

The carrier frequency (UTRA, E-UTRA, and NR) and band class (HRPD and 1xRTT) for which the associated cellReselectionPriority is applied. For NR, the *ARFCN-ValueNR* corresponds to a GSCN value as specified in TS 38.101 [85].

carrierFreqs

The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies.

cellInfoList

Used to provide system information of one or more cells on the redirected inter-RAT carrier frequency. The system information can be used if, upon redirection, the UE selects an inter-RAT cell indicated by the *physCellId* and *carrierFreq* (GERAN and UTRA TDD) or by the *physCellId* (other RATs). The choice shall match the *redirectedCarrierInfo*. In particular, E-UTRAN only applies value *utra-TDD-r10* in case *redirectedCarrierInfo* is set to *utra-TDD-r10*.

cellList

Indicates a list of cells configured as RAN area. For each element, in the absence of *plmn-Identity* the UE considers the registered PLMN. Total number of cells across all PLMNs does not exceed 32.

cn-Type

The *cn-Type* is used to indicate that the UE is redirected from 5GC to EPC or 5GC when *redirectedCarrierInfo* indicates E-UTRA frequency.

drb-ContinueROHC

This field indicates whether to continue or reset the header compression protocol context for the DRBs configured with the header compression protocol. Presence of the field indicates that the header compression protocol context continues when UE initiates UP-EDT in the same cell, while absence indicates that the header compression protocol context is reset.

extendedWaitTime

Value in seconds for the wait time for Delay Tolerant access requests.

freqPriorityListX

Provides a cell reselection priority for each frequency, by means of separate lists for each RAT (including E-UTRA). The UE shall be able to store at least 3 occurrences of *FreqsPriorityGERAN*. If E-UTRAN includes

freqPriorityListEUTRA-v9e0 and/or *freqPriorityListEUTRA-v1310* it includes the same number of entries, and listed in the same order, as in *freqPriorityListEUTRA* (i.e. without suffix). Field *freqPriorityListExt* includes additional neighbouring inter-frequencies, i.e. extending the size of the inter-frequency carrier list using the general principles specified in 5.1.2. EUTRAN only includes *freqPriorityListExtEUTRA* if *freqPriorityListEUTRA* (i.e. without suffix) includes *maxFreq* entries. If E-UTRAN includes *freqPriorityListExtEUTRA-v1310* it includes the same number of entries, and listed in the same order, as in *freqPriorityListExtEUTRA-v1310*.

idleModeMobilityControlInfo

Provides dedicated cell reselection priorities. Used for cell reselection as specified in TS 36.304 [4]. For E-UTRA and UTRA frequencies, a UE that supports multi-band cells for the concerned RAT considers the dedicated priorities to be common for all overlapping bands (i.e. regardless of the ARFCN that is used).

measIdleConfig

Indicates a one-shot measurement configuration to be stored and used by the UE while in RRC_IDLE or RRC_INACTIVE.

periodic-RNAU-timer

Refers to the timer that triggers the periodic RNAU procedure in UE. Value min5 corresponds to 5 minutes, value min10 corresponds to 10 minutes and so on.

ran-Area

Indicates whether TA code(s) or RAN area code(s) are used for the RAN notification area. The network uses only TA code(s) or RAN area code(s) to configure a UE. Total number of TACs across all PLMNs does not exceed 16. Total number of RAN-AreaCode across all PLMNs does not exceed 32.

ran-NotificationAreaInfo

Network ensures that the UE in RRC_INACTIVE always has a valid ran-NotificationAreaInfo.

ranAreaConfigList

Indicates a list of RAN area codes or RA code(s) as RAN area. For each element, in the absence of *plmn-Identity* the UE considers the registered PLMN.

ran-pagingCycle

Refers to the UE specific cycle for RAN-initiated paging. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on.

redirectedCarrierInfo

The redirectedCarrierInfo indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to an E-UTRA or an inter-RAT carrier frequency, by means of the cell selection upon leaving RRC_CONNECTED as specified in TS 36.304 [4]. The value *geran* can only be included after successful security activation when UE is connected to 5GC.

releaseCause

The *releaseCause* is used to indicate the reason for releasing the RRC Connection. The cause value *cs*-*FallbackHighPriority* is only applicable when *redirectedCarrierInfo* is present with the value set to *utra-FDD*, *utra-TDD* or *utra-TDD-r10*. E-UTRAN should not set the *releaseCause* to *loadBalancingTAURequired* or to *cs*-*FallbackHighPriority* if the *extendedWaitTime* is present. The network should not set the *releaseCause* to *loadBalancingTAURequired* if the UE is connected to 5GC.

RRCConnectionRelease field descriptions

rrc-InactiveConfig Indicates configuration for the RRC_INACTIVE state. The network does not configure this field when the UE is redirected to an inter-RAT carrier frequency. *smtc* The SSB periodicity/offset/duration configuration of the redirected target NR frequency. It is based on the timing reference of EUTRAN PCell. If the field is absent, the UE uses the SMTC configured in the *measObjectNR* having the same SSB frequency and subcarrier spacing *subcarrierSpacingSSB*

Indicate subcarrier spacing of SSB of redirected target NR frequency. Only the values 15 or 30 (<6GHz), 120 kHz or 240 kHz (>6GHz) are applicable.

systemInformation

Container for system information of the GERAN cell i.e. one or more System Information (SI) messages as defined in TS 44.018 [45], table 9.1.1.

t320

Timer T320 as described in clause 7.3. Value minN corresponds to N minutes.

utra-BCCH-Container

Contains System Information Container message as defined in TS 25.331 [19].

waitTime

Wait time value in seconds.

Conditional presence	Explanation
5GC	The field is optionally present, Need ON, if the UE is connected to 5GC; otherwise the
	field is not present.
EARFCN-max	The field is mandatory present if the corresponding carrierFreq (i.e. without suffix) is set to
	maxEARFCN. Otherwise the field is not present.
IdleInfoEUTRA	The field is optionally present, Need OP, if the IdleModeMobilityControlInfo (i.e. without
	suffix) is included and includes <i>freqPriorityListEUTRA</i> ; otherwise the field is not present.
INACTIVE	The field is mandatory present in this release.
NoRedirect-r8	The field is optionally present, Need OP, if the redirectedCarrierInfo (i.e. without suffix) is
	not included; otherwise the field is not present.
Redirection	The field is optionally present, Need ON, if the redirectedCarrierInfo is included and set to
	geran, utra-FDD, utra-TDD or utra-TDD-r10; otherwise the field is not present.
UP-EDT	The field is optionally present, Need ON, if the UE supports UP-EDT and releaseCause is
	set to <i>rrc-Suspend</i> ; otherwise the field is not present.

RRCConnectionRequest

The RRCConnectionRequest message is used to request the establishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

-- ASN1START

Logical channel: CCCH

Direction: UE to E-UTRAN

RRCConnectionRequest message

```
RRCConnectionRequest ::=
                                   SEQUENCE {
                                   CHOICE {
   criticalExtensions
       rrcConnectionRequest-r8
                                           RRCConnectionRequest-r8-IEs,
       rrcConnectionRequest-r15
                                           RRCConnectionRequest-5GC-r15-IEs
    }
}
RRCConnectionReguest-r8-IEs ::=
                                   SEQUENCE {
                                       InitialUE-Identity,
    ue-Identity
    establishmentCause
                                       EstablishmentCause,
                                       BIT STRING (SIZE (1))
    spare
}
RRCConnectionRequest-5GC-r15-IEs ::=
                                       SEQUENCE {
                                           InitialUE-Identity-5GC,
   ue-Identity
```

establishmentCause spare }	EstablishmentCause-5GC, BIT STRING (SIZE (1))
<pre>InitialUE-Identity ::= s-TMSI randomValue }</pre>	CHOICE { S-TMSI, BIT STRING (SIZE (40))
<pre>InitialUE-Identity-5GC ::= ng-5G-S-TMSI-Part1 randomValue }</pre>	CHOICE { BIT STRING (SIZE (40)), BIT STRING (SIZE (40))
EstablishmentCause ::= sparel}	ENUMERATED { emergency, highPriorityAccess, mt-Access, mo-Signalling, mo-Data, delayTolerantAccess-v1020, mo-VoiceCall-v1280,
EstablishmentCause-5GC ::=	ENUMERATED { emergency, highPriorityAccess, mt-Access, mo-Signalling, mo-Data, mo-VoiceCall, spare2, spare1}
ASN1STOP	

RRCConnectionRequest field descriptions

establishmentCause

Provides the establishment cause for the RRC connection request as provided by the upper layers. W.r.t. the cause value names: highPriorityAccess concerns AC11..AC15, 'mt' stands for 'Mobile Terminating' and 'mo' for 'Mobile Originating. eNB is not expected to reject a *RRCConnectionRequest* due to unknown cause value being used by the UE. The cause value of *delayTolerantAccess* is not used for E-UTRA/5GC in this release. *randomValue*Integer value in the range 0 to 2⁴⁰ – 1. *ng-5G-S-TMSI-Part1*The rightmost 40 bits of 5G-S-TMSI. *ue-Identity*UE identity included to facilitate contention resolution by lower layers.

RRCConnectionResume

The RRCConnectionResume message is used to resume the suspended RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: E-UTRAN to UE

RRCConnectionResume message

```
RRCConnectionResume-r13 ::=
                                SEOUENCE {
    rrc-TransactionIdentifier
                                RRC-TransactionIdentifier,
    criticalExtensions
                                    CHOICE {
        c1
                                       CHOICE {
            rrcConnectionResume-r13
                                            RRCConnectionResume-r13-IEs,
                                            NULL,
            spare3
            spare2
                                            NULL,
            sparel
                                            NULL
        },
                                        SEQUENCE { }
        criticalExtensionsFuture
    }
}
RRCConnectionResume-r13-IEs ::=
                                    SEOUENCE {
    radioResourceConfigDedicated-r13
                                            RadioResourceConfigDedicated
                                                                            OPTIONAL,
                                                                                        -- Need ON
   nextHopChainingCount-r13
                                            NextHopChainingCount,
```

<pre>measConfig-r13 antennaInfoDedicatedPCell-r13 drb-ContinueROHC-r13 lateNonCriticalExtension rrcConnectionResume-v1430-IEs }</pre>	MeasConfig AntennaInfoDedicated-v10i0 ENUMERATED {true} OCTET STRING RRCConnectionResume-v1430-	OPTIONAL, OPTIONAL,	Need ON
<pre>RRCConnectionResume-v1430-IEs ::= SEQ otherConfig-r14 rrcConnectionResume-v1510-IEs }</pre>	UENCE { OtherConfig-r9 RRCConnectionResume-v1510-IEs	OPTIONAL, OPTIONAL	Need ON
<pre>RRCConnectionResume-v1510-IEs ::= SEQ sk-Counter-r15 nr-RadioBearerConfig1-r15 nr-RadioBearerConfig2-r15 nonCriticalExtension }</pre>	UENCE { INTEGER (0 65535) OCTET STRING OCTET STRING RRCConnectionResume-v1530-IEs	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	Need ON
<pre>RRCConnectionResume-v1530-IEs ::= SEQ fullConfig-r15 nonCriticalExtension }</pre>	UENCE { ENUMERATED {true} SEQUENCE {}	OPTIONAL, OPTIONAL	· Need ON

-- ASN1STOP

RRCConnectionResume field descriptions

drb-ContinueROHC

This field indicates whether to continue or reset the header compression protocol context for the DRBs configured with EUTRA PDCP and the header compression protocol. Presence of the field indicates that the header compression protocol context continues while absence indicates that the header compression protocol context is reset. *fullConfig*

Indicates that the full configuration option is applicable for the RRCConnectionResume message.

nr-RadioBearerConfig1, nr-RadioBearerConfig2

Includes the NR *RadioBearerConfig* IE as specified in TS 38.331 [82]. The field includes the configuration of RBs configured with NR PDCP.

sk-Counter

A one-shot counter used upon initial configuration of S-K_{gNB} as well as upon refresh of S-K_{gNB}. E-UTRAN provides this field when the UE is configured with an (SN-terminated) RB using S-KgNB.

RRCConnectionResumeComplete

The *RRCConnectionResumeComplete* message is used to confirm the successful completion of an RRC connection resumption.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionResumeComplete message

```
RRCConnectionResumeComplete-r13 ::= SEQUENCE {
   rrc-TransactionIdentifier RRC-TransactionIdentifier,
       rrcConnectionResumeComplete-r13 RRCC
criticalExtensionsFuture
   criticalExtensions
                                              RRCConnectionResumeComplete-r13-IEs,
                                                  SEQUENCE { }
   }
}
RRCConnectionResumeComplete-r13-IEs ::= SEQUENCE {
   selectedPLMN-Identity-r13
                                          INTEGER (1..maxPLMN-r11)
                                                                                     OPTIONAL,
   dedicatedInfoNAS-r13
                                          DedicatedInfoNAS
                                                                                     OPTIONAL,
                                          ENUMERATED {true}
   rlf-InfoAvailable-r13
                                                                                      OPTIONAL,
   logMeasAvailable-r13
                                          ENUMERATED {true}
                                                                                      OPTIONAL,
```

connEstFailInfoAvailable-r13	ENUMERATED {true}		OPTIONAL,
mobilityState-r13	ENUMERATED {normal, medium	n, high, spare}	OPTIONAL,
mobilityHistoryAvail-r13	ENUMERATED {true}		OPTIONAL,
logMeasAvailableMBSFN-r13	ENUMERATED {true}		OPTIONAL,
lateNonCriticalExtension	OCTET STRING		OPTIONAL,
nonCriticalExtension	RRCConnectionResumeComple	ce-v1530-IEs	OPTIONAL
}			
RRCConnectionResumeComplete-v1530-IEs :::	= SEQUENCE {		
logMeasAvailableBT-r15	ENUMERATED {true}	OPTIONAL,	
logMeasAvailableWLAN-r15	ENUMERATED {true}	OPTIONAL,	
idleMeasAvailable-r15	ENUMERATED {true}	OPTIONAL,	
flightPathInfoAvailable-r15	ENUMERATED {true}	OPTIONAL,	
nonCriticalExtension	SEQUENCE {}	OPTIONAL	
}			

-- ASN1STOP

RRCConnectionResumeComplete field descriptions

idleMeasAvailable

Indication that the UE has idle mode measurement report available.

selectedPLMN-Identity

Index of the PLMN selected by the UE from the *plmn-IdentityList* fields included in SIB1. 1 if the 1st PLMN is selected from the 1st *plmn-IdentityList* included in SIB1, 2 if the 2nd PLMN is selected from the same *plmn-IdentityList*, or when no more PLMN are present within the same *plmn-IdentityList*, then the PLMN listed 1st in the subsequent *plmn-IdentityList* within the same SIB1 and so on. The *selectedPLMN-Identity* is referred to the PLMN list for 5GC if the UE is in RRC_INACTIVE state.

_

RRCConnectionResumeRequest

The *RRCConnectionResumeRequest* message is used to request the resumption of a suspended RRC connection or to perform UP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

RRCConnectionResumeRequest message

```
-- ASN1START
RRCConnectionResumeRequest-r13 ::= SEQUENCE {
                                       CHOICE {
   criticalExtensions
       rrcConnectionResumeRequest-r13
                                                RRCConnectionResumeRequest-r13-IEs,
        rrcConnectionResumeRequest-r15
                                                RRCConnectionResumeRequest-5GC-r15-IEs
    }
}
RRCConnectionResumeRequest-r13-IEs ::=
                                            SEQUENCE {
   resumeIdentity-r13
                                                    CHOICE {
       resumeID-r13
                                                        ResumeIdentity-r13,
       truncatedResumeID-r13
                                                        BIT STRING (SIZE (24))
    shortResumeMAC-I-r13
                                                    BIT STRING (SIZE (16)),
    resumeCause-r13
                                                    ResumeCause,
                                                    BIT STRING (SIZE (1))
    spare
}
RRCConnectionResumeRequest-5GC-r15-IEs ::=
                                                SEQUENCE {
   resumeIdentity-r15
                                                    CHOICE {
                                                        I-RNTI-r15,
       fullI-RNTI-r15
       shortI-RNTI-r15
                                                        ShortI-RNTI-r15
    shortResumeMAC-I-r15
                                                    BIT STRING (SIZE (16)),
    resumeCause-r15
                                                    ResumeCause-r15,
                                                    BIT STRING (SIZE (1))
    spare
}
```

ResumeCause ::= }	ENUMERATED { emergency, highPriorityAccess, mt-Access, mo-Signalling, mo-Data, delayTolerantAccess-v1020, mo-VoiceCall-v1280, spare1
ResumeCause-r15 ::= }	ENUMERATED { emergency, highPriorityAccess, mt-Access, mo-Signalling, mo-Data, rna-Update, mo-VoiceCall, spare1
ASN1STOP	

RRCConnectionResumeRequest field descriptions

 resumeCause

 Provides the resume cause for the RRC connection resume request as provided by the upper layers. The network is not expected to reject a *RRCConnectionResumeRequest* due to unknown cause value being used by the UE.

 resumeIdentity

 UE identity to facilitate UE context retrieval at eNB

 shortResumeMAC-I

 Authentication token to facilitate UE authentication at eNB

RRCConnectionSetup

The RRCConnectionSetup message is used to establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCConnectionSetup message

ASN1START		
<pre>RRCConnectionSetup ::= SEQ rrc-TransactionIdentifier criticalExtensions cl rrcConnectionSetup-r8 spare7 NULL, spare6 NULL, spare5 NULL, s spare3 NULL, spare2 NULL, s }, criticalExtensionsFuture }</pre>	-	
}		
<pre>RRCConnectionSetup-r8-IEs ::= SEQ radioResourceConfigDedicated nonCriticalExtension }</pre>	UENCE { RadioResourceConfigDedicated, RRCConnectionSetup-v8a0-IEs	OPTIONAL
<pre>RRCConnectionSetup-v8a0-IEs ::= SEQUENC lateNonCriticalExtension nonCriticalExtension }</pre>	E { OCTET STRING SEQUENCE {}	OPTIONAL, OPTIONAL
ASN1STOP		

RRCConnectionSetupComplete

The *RRCConnectionSetupComplete* message is used to confirm the successful completion of an RRC connection establishment.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

RRCConnectionSetupComplete message

```
SEQUENCE {
RRCConnectionSetupComplete ::=
                                     RRC-TransactionIdentifier,
    rrc-TransactionIdentifier
    criticalExtensions
                                          CHOICE {
                                               CHOICE {
        c1
             rrcConnectionSetupComplete-r8
                                                   RRCConnectionSetupComplete-r8-IEs,
             spare3 NULL, spare2 NULL, spare1 NULL
        },
                                               SEQUENCE { }
        criticalExtensionsFuture
    }
}
RRCConnectionSetupComplete-r8-IEs ::= SEQUENCE {
    INTEGER (1..maxPLMN-r11),
    INTEGER (1..maxPLMN-r11),

    selectedPLMN-Identity
    registeredMME
                                          RegisteredMME
                                                                                 OPTIONAL,
    dedicatedInfoNAS
                                           DedicatedInfoNAS,
    nonCriticalExtension
                                          RRCConnectionSetupComplete-v8a0-IEs OPTIONAL
}
RRCConnectionSetupComplete-v8a0-IEs ::= SEQUENCE {
    lateNonCriticalExtension
                                           OCTET STRING
                                                                                      OPTIONAL.
                                           RRCConnectionSetupComplete-v1020-IEs
    nonCriticalExtension
                                                                                      OPTIONAL
}
RRCConnectionSetupComplete-v1020-IEs ::= SEQUENCE {
    gummei-Type-r10ENUMERATED {native, mapped}rlf-InfoAvailable-r10ENUMERATED {true}logMongdymailable-r10ENUMERATED {true}
                                                                                      OPTIONAL,
                                                                                      OPTIONAL,
                                     ENUMERATED {true} OPTIONAL
ENUMERATED {required, notRequired} OPTIONAL
RRCConnectionSetupComplete-v1130-IES OPTIONAL
    logMeasAvailable-r10
                                                                                      OPTIONAL,
    rn-SubframeConfigReq-r10
                                                                                      OPTIONAL,
    nonCriticalExtension
}
RRCConnectionSetupComplete-v1130-IEs ::= SEQUENCE {
    connEstFailInfoAvailable-r11 ENUMERATED {true}
                                                                             OPTIONAL,
    nonCriticalExtension
                                           RRCConnectionSetupComplete-v1250-IEs
                                                                                           OPTIONAL
}
RRCConnectionSetupComplete-v1250-IEs ::= SEQUENCE {
    mobilityState-r12ENUMERATED {normal, medium, high, spare}mobilityHistoryAvail-r12ENUMERATED {true}
                                                                                           OPTIONAL.
                                                                                           OPTIONAL,
    logMeasAvailableMBSFN-r12 ENUMERATED {true}
                                                                                           OPTIONAL,
    nonCriticalExtension
                                          RRCConnectionSetupComplete-v1320-IEs
                                                                                           OPTIONAL
}
RRCConnectionSetupComplete-v1320-IEs ::= SEQUENCE {
                                          ENUMERATED {supported}
    ce-ModeB-r13
                                                                                           OPTIONAL,
    s-TMSI-r13
                                           S-TMSI
                                                                                           OPTIONAL,
    attachWithoutPDN-Connectivity-r13 ENUMERATED {true}
                                                                                           OPTIONAL.
    up-CIOT-EPS-Optimisation-r13 ENUMERATED {true}
cp-CIOT-EPS-Optimisation-r13 ENUMERATED {true}
                                                                                           OPTIONAL,
                                                                                           OPTIONAL,
    nonCriticalExtension
                                          RRCConnectionSetupComplete-v1330-IEs
                                                                                           OPTIONAL
}
RRCConnectionSetupComplete-v1330-IEs ::= SEQUENCE {
    ue-CE-NeedULGaps-r13
                                          ENUMERATED {true}
                                                                                           OPTIONAL,
                                          RRCConnectionSetupComplete-v1430-IEs
    nonCriticalExtension
                                                                                           OPTIONAL
}
RRCConnectionSetupComplete-v1430-IEs ::= SEQUENCE {
    dcn-ID-r14
                                           INTEGER (0..65535)
                                                                                           OPTIONAL,
    nonCriticalExtension
                                           RRCConnectionSetupComplete-v1530-IEs
                                                                                           OPTTONAL.
}
RRCConnectionSetupComplete-v1530-IEs ::= SEQUENCE {
                                          ENUMERATED {true}
    logMeasAvailableBT-r15
                                ENUMERATED { true }
ENUMERATED { true }
                                                                                      OPTIONAL,
    logMeasAvailableWLAN-r15
                                                                                      OPTIONAL,
```

idleMeasAvailable-r15ENUMERATED {true}OPTIONAL,flightPathInfoAvailable-r15ENUMERATED {true}OPTIONAL,connectTo5GC-r15ENUMERATED {true}OPTIONAL,registeredAMF-r15RegisteredAMF-r15OPTIONAL,s-NSSAI-list-r15SEQUENCE(SIZE (1..maxNrofS-NSSAI-r15)) OF S-NSSAI-r15 OPTIONAL, IUNAL, ng-5G-S-TMSI-Bits-r15 CHOICE { ng-5G-S-TMSI-r15 NG-5G-S-TMSI-r15, ng-5G-S-TMSI-Part2-r15 BIT STRING (SIZE (8)) } OPTIONAL, RRCConnectionSetupComplete-v1540-IEs OPTIONAL nonCriticalExtension } RRCConnectionSetupComplete-v1540-IEs ::= SEQUENCE { gummei-Type-v1540ENUMERATED {mappedFrom5G}OPTIONAL,guami-Type-r15ENUMERATED {native, mapped}OPTIONAL,nonCriticalExtensionSEQUENCE {}OPTIONAL } RegisteredMME ::= SEQUENCE { PLMN-Identity plmn-Identity OPTIONAL, BIT STRING (SIZE (16)), mmegi mmec MMEC } RegisteredAMF-r15 ::= SEQUENCE {
 plmn-Identity-r15 PLMN-Identity
 amf-Identifier-r15 AMF-Identifier-r15 OPTIONAL, } -- ASN1STOP

RRCConnectionSetupComplete field descriptions	
attachWithoutPDN-Connectivity	
This field is used to indicate that the UE performs an Attach without PDN connectivity procedure, as indicated by the	Э
upper layers and specified in TS 24.301 [35].	
cp-CloT-EPS-Optimisation	
This field is included when the UE supports the Control plane CIoT EPS Optimisation, as indicated by the upper	
layers, see TS 24.301 [35].	
ce-ModeB	
Indicates whether the UE supports operation in CE mode B, as specified in TS 36.306 [5].	
connectTo5GC	
This field is not used in the specification. It shall not be sent by the UE.	
dcn-ID	
The Dedicated Core Network Identity, see TS 23.401 [41].	
guami-Type	
This field is used to indicate whether the GUAMI included is native (derived from native 5G-GUTI) or mapped (from	
EPS, derived from EPS GUTI) as specified in TS 24.501 [95].	
gummei-Type	
This field is used to indicate whether the GUMMEI included is native (assigned by EPC) or mapped. The value native indicates the GUMMEI is mapped from 2C/2C identificates and	e
indicates the GUMMEI is native, mapped indicates the GUMMEI is mapped from 2G/3G identifiers, and	
mappedFrom5G indicates the GUMMEI is mapped from 5G identifiers. A UE that sets gummei-Type-v1540 to	
mappedFrom5G shall also include gummei-Type-r10 and set it to native.	
idleMeasAvailable	
Indication that the UE has idle mode measurement report available.	
mmegi	
Provides the Group Identity of the registered MME within the PLMN, as provided by upper layers, see TS 23.003 [27	7].
mobilityState	
This field indicates the UE mobility state (as defined in TS 36.304 [4], clause 5.2.4.3) just prior to UE going into	
RRC_CONNECTED state. The UE indicates the value of medium and high when being in Medium-mobility and High	n-
mobility states respectively. Otherwise the UE indicates the value normal.	
ng-5G-S-TMSI-Part2	
The leftmost 8 bits of 5G-S-TMSI.	
registeredAMF	
This field is used to transfer the GUAMI of the AMF where the UE is registered, as provided by upper layers, see TS	3
	'
registeredMME	
This field is used to transfer the GUMMEI of the MME where the UE is registered, as provided by upper layers.	
rn-SubframeConfigReq	
If present, this field indicates that the connection establishment is for an RN and whether a subframe configuration is	5
requested or not.	
selectedPLMN-Identity	
Index of the PLMN selected by the UE from the plmn-IdentityList fields included in SIB1. 1 if the 1st PLMN is selected	
from the 1st plmn-IdentityList included in SIB1, 2 if the 2nd PLMN is selected from the same plmn-IdentityList, or wh	en
no more PLMN are present within the same plmn-IdentityList, then the PLMN listed 1st in the subsequent plmn-	
IdentityList within the same SIB1 and so on.	
s-NSSAI-List	
This field is a list of S-NSSAI as indicated by the upper layers. The UE can report up to eight S-NSSAI per NSSAI, s	see
TS 23.003 [27].	
ue-CE-NeedULGaps	
Indicates whether the UE needs uplink gaps during continuous uplink transmission in FDD as specified in TS 36.211	1
[21] and TS 36.306 [5].	•
up-CloT-EPS-Optimisation	
This field is included when the UE supports the User plane CloT EPS Optimisation, as indicated by the upper layers	
see TS 24.301 [35].	••

– RRCEarlyDataComplete

The *RRCEarlyDataComplete* message is used to confirm the successful completion of the CP-EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

RRCEarlyDataComplete message

-- ASN1START

<pre>RRCEarlyDataComplete-r15 ::= SEQ criticalExtensions rrcEarlyDataComplete-r15 criticalExtensionsFuture } }</pre>	UENCE { CHOICE { RRCEarlyDataComplete-r15-IEs, SEQUENCE {}		
RRCEarlyDataComplete-r15-IEs ::= SE(DUENCE {		
dedicatedInfoNAS-r15	DedicatedInfoNAS	OPTIONAL,	Need ON
extendedWaitTime-r15	INTEGER (11800)	OPTIONAL,	Need ON
idleModeMobilityControlInfo-r15	IdleModeMobilityControlInfo	OPTIONAL,	Need OP
idleModeMobilityControlInfoExt-r15	IdleModeMobilityControlInfo-v9e0	OPTIONAL,	Cond
IdleInfoEUTRA			
redirectedCarrierInfo-r15	RedirectedCarrierInfo-r15-IEs	OPTIONAL,	Need ON
nonCriticalExtension	SEQUENCE { }	OPTIONAL	
}			
RedirectedCarrierInfo-r15-IEs ::= CH	DICE {		
	ValueEUTRA-r9,		
	FreqsGERAN,		
-	ValueUTRA,		
	FreqCDMA2000,		
	FreqCDMA2000,		
	FreqListUTRA-TDD-r10		
}	-		
,			
ASN1STOP			

RRCEarlyDataComplete field descriptions

extendedWaitTime Value in seconds for the wait time for Delay Tolerant access requests.

Conditional presence	Explanation	
IdleInfoEUTRA	The field is optionally present, Need OP, if the <i>IdleModeMobilityControlInfo-r15</i> is	
	included and includes freqPriorityListEUTRA; otherwise the field is not present.	

RRCEarlyDataRequest

The RRCEarlyDataRequest message is used to initiate CP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

RRCEarlyDataRequest message

```
-- ASN1START
```

```
RRCEarlyDataRequest-r15 ::= SEQUENCE {
    criticalExtensions CHOICE {
        rrcEarlyDataRequest-r15 RRCEarlyDataRequest-r15-IEs,
        criticalExtensionsFuture SEQUENCE {}
}
```

```
}
RRCEarlyDataRequest-r15-IEs ::= SEQUENCE {
    s-TMSI-r15 S-TMSI,
    establishmentCause-r15 ENUMERATED { mo-Data-r15, delayTolerantAccess-r15},
    dedicatedInfoNAS-r15 DedicatedInfoNAS,
    nonCriticalExtension SEQUENCE {} OPTIONAL
}
```

-- ASN1STOP

RRCEarlyDataRequest field descriptions

establishmentCause Provides the establishment cause for the RRC Early Data Request as provided by the upper layers. W.r.t. the cause value names: 'mo' stands for 'Mobile Originating'. eNB is not expected to reject a *RRCEarlyDataRequest* due to unknown cause value being used by the UE.

SCGFailureInformation

The *SCGFailureInformation* message is used to provide information regarding E-UTRA SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

SCGFailureInformation message

```
-- ASN1START
SCGFailureInformation-r12 ::= SEQUENCE {
criticalExtensions CHOICE
                                   CHOICE {
            scgFailureInformation-r12 Score
        c1
                                                SCGFailureInformation-r12-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture SEQUENCE {}
   }
}
SCGFailureInformation-r12-IEs ::= SEQUENCE {
   failureReportSCG-r12
nonCriticalExtension
SCGFailureInformation-v12d0a-IE
                                                                         OPTIONAL,
                                        SCGFailureInformation-v12d0a-IEs OPTIONAL
}
                      tension OCTET STRING (CONTAINING SCGFailureInformation-v12d0b-IEs)
OPTIONAL,
SCGFailureInformation-v12d0a-IEs ::= SEQUENCE {
   lateNonCriticalExtension
   nonCriticalExtension
                                       SEQUENCE { }
                                                                             OPTTONAL.
}
 - Late non-critical extensions:
SCGFailureInformation-v12d0b-IEs ::= SEQUENCE {
   failureReportSCG-v12d0 FailureReportSCG-v12d0 OPTIONAL,
   nonCriticalExtension
                                        SEQUENCE { }
                                                                             OPTIONAL
}
-- Regular non-critical extensions:
FailureReportSCG-r12 ::= SEQUENCE {
                                   ENUMERATED {t313-Expiry, randomAccessProblem,
   failureType-r12
                                               rlc-MaxNumRetx, scg-ChangeFailure },
   rıc-MaxNumRetx, scg-ChangeFailure },
measResultServFreqList-r12 MeasResultServFreqList-r10 OPTIONAL,
measResultNeighCells-r12 MeasResultList2EUTRA-r9 OPTIONAL,
    [[ failureType-v1290
                                        ENUMERATED {maxUL-TimingDiff-v1290} OPTIONAL
    1],
    ]]]
      measResultServFreqListExt-r13 MeasResultServFreqListExt-r13
                                                                             OPTIONAL
    ]]
```

```
}
FailureReportSCG-v12d0 ::= SEQUENCE {
    measResultNeighCells-v12d0 MeasResultList2EUTRA-v9e0 OPTIONAL
}
-- ASN1STOP
```

_

SCGFailureInformationNR

The SCGFailureInformationNR message is used to provide information regarding NR SCG failures detected by the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

SCGFailureInformationNR message

```
CHOICE {
scgFailureInformationNR-r15
spare3 NULL

       c1
                                              SCGFailureInformationNR-r15-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                          SEQUENCE { }
   }
}
SCGFailureInformationNR-r15-IEs ::= SEQUENCE {
   failureReportSCG-NR-r15 FailureReportSCG-NR-r15
                                                                   OPTIONAL,
                                      SEQUENCE { }
   nonCriticalExtension
                                                                      OPTIONAL
}
FailureReportSCG-NR-r15 ::= SEQUENCE {
                                      ENUMERATED {
   failureType-r15
                                          t310-Expiry, randomAccessProblem,
                                          rlc-MaxNumRetx,
                                           synchReconfigFailureSCG, scg-reconfigFailure,
                                          srb3-IntegrityFailure},
   measResultFreqListNR-r15
                                          MeasResultFreqListFailNR-r15
                                                                              OPTIONAL,
   measResultSCG-r15
                                          OCTET STRING
                                                                              OPTIONAL,
    . . .
}
MeasResultFreqListFailNR-r15 ::= SEQUENCE (SIZE (1..maxFreqNR-r15)) OF MeasResultFreqFailNR-r15
MeasResultFreqFailNR-r15 ::= SEQUENCE {
carrierFreq-r15 ARFCN-
measResultCellList-r15 MeasRe
                                   ARFCN-ValueNR-r15,
   measResultCellList-r15
                                      MeasResultCellListNR-r15
                                                                        OPTIONAL,
}
```

-- ASN1STOP

SCGFailureInformationNR field descriptions

measResultFreqListNR The field contains available results of measurements on NR frequencies the UE is configured to measure by *measConfig. measResultSCG*

Includes the NR *MeasResultSCG-Failure* IE as specified in TS 38.331 [82]. The field contains available results of measurements on NR frequencies the UE is configured to measure by the NR RRCConfiguration message.

SCPTMConfiguration

The *SCPTMConfiguration* message contains the control information applicable for MBMS services transmitted via SC-MRB.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: SC-MCCH

Direction: E-UTRAN to UE

SCPTMConfiguration message

```
-- ASN1START
```

<pre>SCPTMConfiguration-r13 ::= SEQ sc-mtch-InfoList-r13 scptm-NeighbourCellList-r13 lateNonCriticalExtension nonCriticalExtension }</pre>	UENCE { SC-MTCH-InfoList-r13, SCPTM-NeighbourCellList-r13 OCTET STRING SCPTMConfiguration-v1340	OPTIONAL, OPTIONAL, OPTIONAL	Need OP
<pre>SCPTMConfiguration-v1340 ::= SEQUEN p-b-r13 nonCriticalExtension }</pre>	CE { INTEGER (03) SEQUENCE {}	OPTIONAL, Nee OPTIONAL	d ON

-- ASN1STOP

SCPTMConfiguration field descriptions

 sc-mtch-InfoList

 Provides the configuration of each SC-MTCH in the current cell.

 scptm-NeighbourCellList

 List of neighbour cells providing MBMS services via SC-MRB. When absent, the UE shall assume that MBMS services listed in the SCPTMConfiguration message are not provided via SC-MRB in any neighbour cell.

 p-b

 Parameter: P_B for the PDSCH scrambled by G-RNTI, see TS 36.213 [23], Table 5.2-1.

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SCPTMConfiguration-BR

The *SCPTMConfiguration-BR* message contains the control information applicable for MBMS services transmitted via SC-MRB for BL UEs or UEs in CE.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: SC-MCCH

Direction: E-UTRAN to UE

SCPTMConfiguration-BR message

```
-- ASN1START
```

-- ASN1STOP

SCPTMConfiguration-BR-r14 ::=	SEQUENCE {		
sc-mtch-InfoList-r14	SC-MTCH-InfoList-BR-r14,		
scptm-NeighbourCellList-r14	SCPTM-NeighbourCellList-r13	OPTIONAL,	Need OP
p-b-r14	INTEGER (03)	OPTIONAL,	Need OR
lateNonCriticalExtension	OCTET STRING	OPTIONAL,	
nonCriticalExtension	SEQUENCE { }	OPTIONAL	
}			
·			

	SCPTMConfiguration-BR field descriptions
p-b	
Parameter: 1	P_B for the PDSCH scrambled by G-RNTI, see TS 36.213 [23], Table 5.2-1.
sc-mtch-Info	oList
Provides the	configuration of each SC-MTCH in the current cell for BL UEs or UEs in CE.
scptm-Neigl	hbourCellList
	pour cells providing MBMS services via SC-MRB. When absent, the BL UE or UE in CE shall assume that
MBMS servic	ces listed in the SCPTMConfiguration-BR message are not provided via SC-MRB in any neighbour cell.

SecurityModeCommand

The SecurityModeCommand message is used to command the activation of AS security.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

SecurityModeCommand message

```
-- ASN1START
   curityModeCommand ::= SEQUENCE {
rrc-TransactionIdentifier RRC-TransactionIdentifier,
criticalExtensions CHOICE {
    c1 CHOICE {
        securityModeCommand-r8 SecurityModeCommand

SecurityModeCommand ::=
                                                         SecurityModeCommand-r8-IEs,
               spare3 NULL, spare2 NULL, spare1 NULL
          },
          criticalExtensionsFuture
                                                      SEQUENCE { }
     }
}
SecurityModeCommand-r8-IEs ::= SEQUENCE {
securityConfigSMC SecurityConfigSMC,
nonCriticalExtension SecurityModeCommand-v8a0-IEs OPTIONAL
}
SecurityModeCommand-v8a0-IEs ::= SEQUENCE {
                                                                                               OPTIONAL,
     lateNonCriticalExtension OCTET STRING
     nonCriticalExtension
                                                  SEQUENCE { }
                                                                                                 OPTIONAL
}
   curityConfigSMC ::= SEQUENCE {
securityAlgorithmConfig Securit
SecurityConfigSMC ::=
                                                     SecurityAlgorithmConfig,
     . . .
}
-- ASN1STOP
```

SecurityModeComplete

The SecurityModeComplete message is used to confirm the successful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

SecurityModeComplete message

-- ASN1START

<pre>SecurityModeComplete ::= rrc-TransactionIdentifier criticalExtensions securityModeComplete-r8 criticalExtensionsFuture }</pre>	<pre>SEQUENCE { RRC-TransactionIdentifier, CHOICE { SecurityModeComplete-r8-IEs, SEQUENCE {}</pre>	
}		
SecurityModeComplete-r8-IEs ::= nonCriticalExtension }	SEQUENCE { SecurityModeComplete-v8a0-IEs	OPTIONAL
<pre>SecurityModeComplete-v8a0-IEs ::= S lateNonCriticalExtension nonCriticalExtension }</pre>	SEQUENCE { OCTET STRING SEQUENCE {}	OPTIONAL, OPTIONAL

-- ASN1STOP

SecurityModeFailure

The SecurityModeFailure message is used to indicate an unsuccessful completion of a security mode command.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

SecurityModeFailure message

```
-- ASN1START
    urityModeFailure ::= SEQUENCE {
    rrc-TransactionIdentifier RRC-TransactionIdentifier,
    criticalExtensions CHOICE {
        securityModeFailure-r8 SecurityModeFailure-r8
        criticalExtensionsFuture SEQUENCE {}
SecurityModeFailure ::=
                                                   SecurityModeFailure-r8-IEs,
     }
}
SecurityModeFailure-r8-IEs ::=
                                            SEQUENCE {
    nonCriticalExtension
                                                   SecurityModeFailure-v8a0-IEs OPTIONAL
}
SecurityModeFailure-v8a0-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING
                                                                                                   OPTIONAL,
                                                   SEQUENCE { }
    nonCriticalExtension
                                                                                                   OPTIONAL
}
```

-- ASN1STOP

SidelinkUEInformation

The SidelinkUEInformation message is used for the indication of sidelink information to the eNB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

SidelinkUEInformation message

-- ASN1START

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```
SidelinkUEInformation-r12 ::= SEQUENCE {
                                  CHOICE {
    criticalExtensions
                                          CHOICE {
        c1
             sidelinkUEInformation-r12
                                               SidelinkUEInformation-r12-IEs,
             spare3 NULL, spare2 NULL, spare1 NULL
        }.
        criticalExtensionsFuture
                                              SEOUENCE { }
    }
}
SidelinkUEInformation-r12-IEs ::= SEQUENCE {

    commRxInterestedFreq-r12
    ARFCN-ValueEUTRA-r9

    commTxResourceReq-r12
    SL-CommTxResourceReq-r12

    discRxInterest-r12
    ENUMERATED {true}

    discTxResourceReq-r12
    INTEGER (1..63)

    lateNumCriticalExtension
    OCTET STRINC

                                                                              OPTIONAL,
                                                                              OPTIONAL,
                                                                              OPTIONAL,
                                                                              OPTIONAL,
    lateNonCriticalExtension
                                          OCTET STRING
                                                                              OPTIONAL,
    nonCriticalExtension
                                           SidelinkUEInformation-v1310-IEs OPTIONAL
}
SidelinkUEInformation-v1310-IEs ::= SEQUENCE {
    commTxResourceInfoReqRelay-r13 SEOUENCE {
                                                                                       OPTIONAL,
        commTxResourceReqRelay-r13 SL-CommTxResourceReq-r12
ue-Type-r13 SL-CommTxResourceReq-r12
ENIMERATED (m)
        commTxResourceReqRelay-r13
                                                                                      OPTIONAL.
                                                                                       OPTIONAL.
                                                                                       OPTIONAL,
    discTxResourceReq-v1310 SEQUENCE {
carrierFreqDiscTx-r13 INTEGE
                                        INTEGER (1..maxFreq)
                                                                                       OPTIONAL.
        discTxResourceReqAddFreq-r13 SL-DiscTxResourceReqPerFreqList-r13
                                                                                       OPTIONAL
                                                                                       OPTIONAL.
                                 SL-DiscTxResourceReq-r13
    discTxResourceReqPS-r13
                                                                                       OPTIONAL,
    discRxGapReq-r13
                                      SL-GapRequest-r13
                                                                                       OPTIONAL,
                                     SL-GapRequest-r13
                                                                                       OPTIONAL,
    discTxGapReq-r13
    discSysInfoReportFreqList-r13 SL-DiscSysInfoReportFreqList-r13
                                                                                       OPTIONAL,
    nonCriticalExtension
                                      SidelinkUEInformation-v1430-IEs
                                                                                       OPTIONAL
}
SidelinkUEInformation-v1430-IEs ::= SEQUENCE {
    v2x-CommRxInterestedFreqList-r14 SL-V2X-CommFreqList-r14
                                                                                      OPTIONAL,
    p2x-CommTxType-r14
                                          ENUMERATED {true}
                                                                                       OPTIONAL.
    p2x-CommTxType-r14ENUMERATED {true}v2x-CommTxResourceReq-r14SL-V2X-CommTxFreqList-r14nonCriticalExtensionSidelinkUEInformation-v153
                                                                                       OPTIONAL.
    nonCriticalExtension
                                         SidelinkUEInformation-v1530-IEs
                                                                                      OPTIONAL
}
SidelinkUEInformation-v1530-IEs ::= SEQUENCE {
    reliabilityInfoListSL-r15 SL-ReliabilityList-r15
                                                                                       OPTIONAL.
    nonCriticalExtension
                                           SEQUENCE { }
                                                                                       OPTIONAL
}
SL-CommTxResourceReq-r12 ::=
                                      SEOUENCE {
    carrierFreq-r12
                                           ARFCN-ValueEUTRA-r9
                                                                                      OPTIONAL,
    destinationInfoList-r12
                                           SL-DestinationInfoList-r12
}
SL-DiscTxResourceReqPerFreqList-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF SL-DiscTxResourceReq-r13
SL-DiscTxResourceReq-r13 ::=
                                     SEQUENCE {
    carrierFreqDiscTx-r13
discTxResourceReq-r13
                                           INTEGER (1..maxFreq)
                                                                                      OPTIONAL,
                                           INTEGER (1..63)
}
SL-DestinationInfoList-r12 ::= SEQUENCE (SIZE (1..maxSL-Dest-r12)) OF SL-DestinationIdentity-r12
SL-DestinationIdentity-r12 ::= BIT STRING (SIZE (24))
SL-DiscSysInfoReportFreqList-r13 ::= SEQUENCE (SIZE (1.. maxSL-DiscSysInfoReportFreq-r13)) OF SL-
DiscSysInfoReport-r13
SL-V2X-CommFreqList-r14 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF INTEGER (0..maxFreqV2X-1-r14)
SL-V2X-CommTxFreqList-r14 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF SL-V2X-CommTxResourceReq-r14
SL-V2X-CommTxResourceReq-r14 ::=
                                       SEQUENCE {
    carrierFreqCommTx-r14
                                           INTEGER (0.. maxFreqV2X-1-r14)
                                                                                       OPTIONAL,
                                                                                       OPTIONAL,
    v2x-TypeTxSync-r14
                                          SL-TypeTxSync-r14
    v2x-DestinationInfoList-r14
                                           SL-DestinationInfoList-r12
                                                                                       OPTIONAL
}
```

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-- ASN1STOP

SidelinkUEInformation field descriptions

carrierFreqCommTx

Indicates the index of the frequency on which the UE is interested to transmit V2X sidelink communication. The value 1 corresponds to the frequency of first entry in *v2x-InterFreqInfoList* broadcast in SIB21, the value 2 corresponds to the frequency of second entry in *v2x-InterFreqInfoList* broadcast in SIB21 and so on. If SIB26 is broadcast and the number of entries included in *v2x-InterFreqInfoList* of SIB21 is N, the value N+1 corresponds to the frequency of the first entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, the value N+2 corresponds to the frequency of the second entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, and so on. The value 0 corresponds the PCell's frequency.

carrierFreqDiscTx

Indicates the frequency by the index of the entry in field *discInterFreqList* within *SystemInformationBlockType19*. Value 1 corresponds to the first entry in *discInterFreqList* within *SystemInformationBlockType19*, value 2 corresponds to the second entry in this list and so on.

commRxInterestedFreq

Indicates the frequency on which the UE is interested to receive sidelink communication.

commTxResourceReq

Indicates the frequency on which the UE is interested to transmit non-relay related sidelink communication as well as the one-to-many sidelink communication transmission destination(s) for which the UE requests E-UTRAN to assign dedicated resources. NOTE 1.

commTxResourceReaRelav

Indicates the relay related one-to-many sidelink communication transmission destination(s) for which the sidelink relay UE requests E-UTRAN to assign dedicated resources.

commTxResourceReqRelayUC

Indicates the relay related one-to-one sidelink communication transmission destination(s) for which the sidelink relay UE or sidelink remote UE requests E-UTRAN to assign dedicated resources i.e. either contains the unicast destination identity of the sidelink relay UE or of the sidelink remote UE.

commTxResourceReqUC

Indicates the frequency on which the UE is interested to transmit non-relay related one-to-one sidelink communication as well as the sidelink communication transmission destination(s) for which the UE requests E-UTRAN to assign dedicated resources. NOTE 1.

destinationInfoList

Indicates the destination(s) for relay or non-relay related one-to-one or one-to-many sidelink communication. For oneto-one sidelink communication the destination is identified by the ProSe UE ID for unicast communication, while for one-to-many the destination it is identified by the ProSe Layer-2 Group ID as specified in TS 23.303 [68].

discRxInterest

Indicates that the UE is interested to monitor sidelink discovery announcements.

discSysInfoReportFreqList

Indicates, for one or more frequencies, a list of sidelink discovery related parameters acquired from system Information of cells on configured inter-frequency carriers.

discTxResourceReq

Indicates the number of separate discovery message(s) the UE wants to transmit every discovery period. This field concerns the resources the UE requires every discovery period for transmitting sidelink discovery announcement(s).

discTxResourceReqAddFreq

Indicates, for any frequencies in addition to the one covered by *discTxResourceReq*, the number of separate discovery message(s) the UE wants to transmit every discovery period. This field concerns the resources the UE requires every discovery period for transmitting sidelink discovery announcement(s).

discTxResourceReqPS

Indicates the number of separate PS related discovery message(s) the UE wants to transmit every discovery period. This field concerns the resources the UE requires every discovery period for transmitting PS related sidelink discovery announcement(s).

p2x-CommTxType

Indicates that the requested transmission resource pool is for P2X related V2X sidelink communication.

reliabilityInfoListSL

Indicates the reliability(ies) (i.e., PPPRs as specified in TS 36.300 [9]), associated with the reported traffic to be transmitted for V2X sidelink communication.

v2x-CommRxInterestedFreqList

Indicates the index(es) of the frequency(ies) on which the UE is interested to receive V2X sidelink communication. The value 1 corresponds to the frequency of first entry in *v2x-InterFreqInfoList* broadcast in SIB21, the value 2 corresponds to the frequency of second entry in *v2x-InterFreqInfoList* broadcast in SIB21 and so on. If SIB26 is broadcast and the number of entries included in *v2x-InterFreqInfoList* of SIB21 is N, the value N+1 corresponds to the frequency of the first entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, the value N+2 corresponds to the frequency of the second entry which is included in *v2x-InterFreqInfoList* broadcast in SIB26 and has a frequency not included in SIB21, and so on. The value 0 corresponds to the PCell's frequency.

v2x-DestinationInfoList

Indicates the destination(s) for V2X sidelink communication.

v2x-TypeTxSync

Indicates the synchronization reference used by the UE.

NOTE 1: When configuring *commTxResourceReq*, *commTxResourceReqUC*, *commTxResourceReqRelay* and *commTxResourceReqRelayUC*, E-UTRAN configures at most *maxSL-Dest-r12* destinations in total (i.e. as included in the four fields together).

SystemInformation

The *SystemInformation* message is used to convey one or more System Information Blocks or Positioning System Information Blocks. All the SIBs or posSIBs included are transmitted with the same periodicity. *SystemInformation-BR* and *SystemInformation-MBMS* use the same structure as *SystemInformation*.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH and BR-BCCH

Direction: E-UTRAN to UE

SystemInformation message

```
-- ASN1START
SystemInformation-BR-r13 ::=
                                 SystemInformation
SystemInformation-MBMS-r14 ::= SystemInformation
SystemInformation ::=
                                    SEOUENCE {
                              CHOICE {
    criticalExtensions
        systemInformation-ro
criticalExtensionsFuture-r15
posSystemInformation-r15
                                          SystemInformation-r8-IEs,
        systemInformation-r8
                                             CHOICE {
                                                 PosSystemInformation-r15-IEs,
            criticalExtensionsFuture
                                                 SEQUENCE { }
        }
    }
SystemInformation-r8-IEs ::=
                                     SEQUENCE {
    sib-TypeAndInfo
                                         SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {
        sib2
                                             SystemInformationBlockType2,
        sib3
                                             SystemInformationBlockType3,
        sib4
                                             SystemInformationBlockType4,
                                             SystemInformationBlockType5,
        sib5
        sib6
                                             SystemInformationBlockType6,
        sib7
                                             SystemInformationBlockType7,
        sib8
                                             SystemInformationBlockType8,
        sib9
                                             SystemInformationBlockType9
        sib10
                                             SystemInformationBlockType10,
        sib11
                                             SystemInformationBlockTypel1,
        sib12-v920
                                             SystemInformationBlockType12-r9,
        sib13-v920
                                             SystemInformationBlockType13-r9,
        sib14-v1130
                                             SystemInformationBlockType14-r11,
        sib15-v1130
                                             SystemInformationBlockType15-r11,
        sib16-v1130
                                             SystemInformationBlockType16-r11,
        sib17-v1250
                                             SystemInformationBlockType17-r12,
        sib18-v1250
                                             SystemInformationBlockType18-r12,
        sib19-v1250
                                             SystemInformationBlockType19-r12,
        sib20-v1310
                                             SystemInformationBlockType20-r13,
        sib21-v1430
                                             SystemInformationBlockType21-r14,
        sib24-v1530
                                             SystemInformationBlockType24-r15,
        sib25-v1530
                                             SystemInformationBlockType25-r15,
        sib26-v1530
                                             SystemInformationBlockType26-r15
    },
    nonCriticalExtension
                                         SystemInformation-v8a0-IEs
                                                                          OPTIONAL
}
SystemInformation-v8a0-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING
                                                                          OPTIONAL,
    nonCriticalExtension
                                     SEQUENCE { }
                                                                          OPTIONAL
```

PosSystemInformation-r15-IEs ::=	SECTIENCE {	
posSIB-TypeAndInfo-r15	SEQUENCE (SIZE (1maxSIB)) OF CHOICE	1
posSib1-1-r15	SystemInformationBlockPos-r15,	L. L
posSib1-2-r15	SystemInformationBlockPos-r15,	
posSib1-3-r15	SystemInformationBlockPos-r15,	
posSib1-4-r15	SystemInformationBlockPos-r15,	
posSib1-5-r15	SystemInformationBlockPos-r15,	
posSib1-6-r15	SystemInformationBlockPos-r15,	
posSib1-7-r15	SystemInformationBlockPos-r15,	
posSib2-1-r15	SystemInformationBlockPos-r15,	
posSib2-2-r15	SystemInformationBlockPos-r15,	
posSib2-3-r15	SystemInformationBlockPos-r15,	
posSib2-4-r15	SystemInformationBlockPos-r15,	
posSib2-5-r15	SystemInformationBlockPos-r15,	
posSib2-6-r15	SystemInformationBlockPos-r15,	
posSib2-7-r15	SystemInformationBlockPos-r15,	
posSib2-8-r15	SystemInformationBlockPos-r15,	
posSib2-9-r15	SystemInformationBlockPos-r15,	
posSib2-10-r15	SystemInformationBlockPos-r15,	
posSib2-11-r15	SystemInformationBlockPos-r15,	
posSib2-12-r15	SystemInformationBlockPos-r15,	
posSib2-13-r15	SystemInformationBlockPos-r15,	
posSib2-14-r15	SystemInformationBlockPos-r15,	
posSib2-15-r15	SystemInformationBlockPos-r15,	
posSib2-16-r15	SystemInformationBlockPos-r15,	
posSib2-17-r15	SystemInformationBlockPos-r15,	
posSib2-18-r15	SystemInformationBlockPos-r15,	
posSib2-19-r15	SystemInformationBlockPos-r15,	
posSib3-1-r15	SystemInformationBlockPos-r15,	
},		
lateNonCriticalExtension	OCTET STRING	OPTIONAL,
nonCriticalExtension	SEQUENCE { }	OPTIONAL
}		
ASN1STOP		

SystemInformationBlockType1

SystemInformationBlockType1 contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information. *SystemInformationBlockType1-BR* uses the same structure as *SystemInformationBlockType1*.

Signalling radio bearer: N/A

RLC-SAP: TM

-- ASN1START

Logical channels: BCCH and BR-BCCH

Direction: E-UTRAN to UE

SystemInformationBlockType1 message

SystemInformationBlockType1-BR-r13	::= SystemInformationBlockTyp	pel	
SystemInformationBlockType1 ::=	SEQUENCE {		
cellAccessRelatedInfo	SEQUENCE {		
plmn-IdentityList	PLMN-IdentityList,		
trackingAreaCode	TrackingAreaCode,		
cellIdentity	CellIdentity,		
cellBarred	ENUMERATED {barred, 1	notBarred},	
intraFreqReselection	ENUMERATED {allowed,	notAllowed},	
csg-Indication	BOOLEAN,		
csg-Identity	CSG-Identity	OPTIONAL	Need OR
},	-		
cellSelectionInfo	SEQUENCE {		
q-RxLevMin	Q-RxLevMin,		
g-RxLevMinOffset	INTEGER (18)	OPTIONAL	Need OP
},			
p-Max	P-Max	OPTIONAL,	Need OP
}, p-Max	P-Max	OPTIONAL,	Need OP

freqBandIndicator schedulingInfoList tdd-Config si-WindowLength	FreqBandIndicator, SchedulingInfoList, TDD-Config OPTIONAL, Cond TDD ENUMERATED {
	ms1, ms2, ms5, ms10, ms15, ms20, ms40},
<pre>systemInfoValueTag nonCriticalExtension }</pre>	INTEGER (031), SystemInformationBlockType1-v890-IES OPTIONAL
SystemInformationBlockType1-v890-IEs: lateNonCriticalExtension IEs) OPTIONAL.	<pre>:= SEQUENCE { OCTET STRING (CONTAINING SystemInformationBlockType1-v8h0-</pre>
<pre>IEs) OPTIONAL,</pre>	SystemInformationBlockType1-v920-IEs OPTIONAL
Late non critical extensions	
SystemInformationBlockTypel-v8h0-IEs multiBandInfoList nonCriticalExtension	MultiBandInfoList OPTIONAL, Need OR
}	SystemInformationBlockType1-v9e0-IEs OPTIONAL
SystemInformationBlockType1-v9e0-IEs	::= SEQUENCE {
freqBandIndicator-v9e0	FreqBandIndicator-v9e0 OPTIONAL, Cond FBI-max
multiBandInfoList-v9e0	MultiBandInfoList-v9e0 OPTIONAL, Cond mFBI-max
<pre>nonCriticalExtension }</pre>	SystemInformationBlockType1-v10j0-IEs OPTIONAL
SystemInformationBlockType1-v10j0-IEs freqBandInfo-r10	NS-PmaxList-r10 OPTIONAL, Need OR
multiBandInfoList-v10j0	MultiBandInfoList-v10j0 OPTIONAL, Need OR
nonCriticalExtension	SystemInformationBlockType1-v1010-IEs
OPTIONAL	
}	
SystemInformationBlockType1-v1010-IEs	::= SEQUENCE {
freqBandInfo-v1010	NS-PmaxList-v1010 OPTIONAL, Need OR
multiBandInfoList-v1010 nonCriticalExtension	MultiBandInfoList-v1010 OPTIONAL, Need OR SEQUENCE {} OPTIONAL
}	SEQUENCE () OFFICIAL
Regular non critical extensions SystemInformationBlockType1-v920-IEs	::= SEQUENCE {
ims-EmergencySupport-r9	ENUMERATED {true} OPTIONAL, Need OR
cellSelectionInfo-v920	CellSelectionInfo-v920 OPTIONAL, Cond RSRQ
nonCriticalExtension	SystemInformationBlockType1-v1130-IEs OPTIONAL
}	
SystemInformationBlockType1-v1130-IEs	::= SEQUENCE {
-	DD-Config-v1130 OPTIONAL, Cond TDD-OR
	ellSelectionInfo-v1130 OPTIONAL, Cond WB-RSRQ ystemInformationBlockTypel-v1250-IES OPTIONAL
}	ysteminiormationbiockryper-vizio-its Oprional
SystemInformationBlockType1-v1250-IEs cellAccessRelatedInfo-v1250	::= SEQUENCE { SEOUENCE {
category0Allowed-r12	ENUMERATED {true} OPTIONAL Need OP
},	
cellSelectionInfo-v1250 freqBandIndicatorPriority-r12	CellSelectionInfo-v1250 OPTIONAL, Cond RSRQ2 ENUMERATED {true} OPTIONAL, Cond mFBI
	ENUMERATED {true} OPTIONAL, Cond mFBI ystemInformationBlockType1-v1310-IEs OPTIONAL
}	2
SystemInformationBlockType1-v1310-IEs	::= SEQUENCE {
hyperSFN-r13	BIT STRING (SIZE (10)) OPTIONAL, Need OR
eDRX-Allowed-r13	ENUMERATED {true} OPTIONAL, Need OR
cellSelectionInfoCE-r13	CellSelectionInfoCE-r13 OPTIONAL, Need OP
bandwidthReducedAccessRelatedInfc si-WindowLength-BR-r13	-r13 SEQUENCE { ENUMERATED {
	ms20, ms40, ms60, ms80, ms120,
	ms160, ms200, spare},
si-RepetitionPattern-r13	<pre>ENUMERATED {everyRF, every2ndRF, every4thRF,</pre>
schedulingInfoList-BR-r13	SchedulingInfoList-BR-r13 OPTIONAL, Cond SI-
BR fdd_DownlinkOrTddSubframeBitm	ADDER-13 CHOTCE
fdd-DownlinkOrTddSubframeBitm subframePattern10-r13	apBR-r13 CHOICE { BIT STRING (SIZE (10)),
subframePattern40-r13	BIT STRING (SIZE (40))

```
OPTIONAL,
                                                                                        -- Need OP
                                                BIT STRING (SIZE (10))
        fdd-UplinkSubframeBitmapBR-r13
                                                                            OPTIONAL,
                                                                                        -- Need OP
        startSymbolBR-r13
si-HoppingConfigCommon-r13
                                               INTEGER (1..4),
ENUMERATED {on,off},
true} OPTIONAL,
                                                INTEGER (1..4),
                                                ENUMERATED {true} OPTIONAL, -- Need OP
SystemInfoValueTagList-r13 OPTIONAL -- Need OR
        systemInfoValueTagList-r13
                                                                    OPTIONAL, -- Cond BW-reduced
                                                SystemInformationBlockType1-v1320-IEs OPTIONAL
    nonCriticalExtension
}
SystemInformationBlockType1-v1320-IEs ::= SEQUENCE {
        mpdcch-pdsch-HoppingNB-r13
    freqHoppingParametersDL-r13
                                               ENUMERATED {nb2, nb4}
                                                                          OPTIONAL,
                                                                                        -- Need OR
        interval-DLHoppingConfigCommonModeA-r13 CHOICE {
            interval-FDD-r13
                                               ENUMERATED {int1, int2, int4, int8}
           interval-TDD-r13
                                                ENUMERATED {int1, int5, int10, int20}
                                                                            OPTIONAL,
                                                                                        -- Need OR
        interval-DLHoppingConfigCommonModeB-r13 CHOICE {
                                                ENUMERATED {int2, int4, int8, int16},
           interval-FDD-r13
            interval-TDD-r13
                                                ENUMERATED { int5, int10, int20, int40}
        }
                                                                           OPTIONAL,
                                                                                        -- Need OR
        mpdcch-pdsch-HoppingOffset-r13
                                               INTEGER (1..maxAvailNarrowBands-r13)
                                                                                       OPTIONAL --
Need OR
                                                                    OPTIONAL,
                                                                                -- Cond Hopping
   }
    nonCriticalExtension
                                                SystemInformationBlockType1-v1350-IEs
    OPTIONAL
}
SystemInformationBlockType1-v1350-IEs ::= SEQUENCE {
   cellSelectionInfoCE1-r13
                                            CellSelectionInfoCE1-r13 OPTIONAL,
                                                                                    -- Need OP
    nonCriticalExtension
                                            SystemInformationBlockType1-v1360-IEs
    OPTIONAL
}
SystemInformationBlockType1-v1360-IEs ::= SEQUENCE {
   cellSelectionInfoCE1-v1360
                                            CellSelectionInfoCE1-v1360 OPTIONAL,
                                                                                    -- Cond
OrxlevminCE1
   nonCriticalExtension
                                                SystemInformationBlockType1-v1430-IEs
                                                                                            OPTIONAL
}
SystemInformationBlockType1-v1430-IEs ::= SEQUENCE {
    eCallOverIMS-Support-r14
                                           ENUMERATED {true} OPTIONAL,
TDD-Config-v1430 OPTIONAL.
                                                                                    -- Need OR
                                                                       OPTIONAL,
                                           TDD-Config-v1430
    tdd-Config-v1430
                                                                                    -- Cond TDD-OR
    cellAccessRelatedInfoList-r14
                                           SEQUENCE (SIZE (1..maxPLMN-1-r14)) OF
                                           CellAccessRelatedInfo-r14 OPTIONAL,
                                                                                    -- Need OR
    nonCriticalExtension
                                            SystemInformationBlockType1-v1450-IEs
   OPTTONAL.
}
SystemInformationBlockType1-v1450-IEs ::= SEQUENCE {
                                            TDD-Config-v1450 OPTIONAL,
    tdd-Config-v1450
                                                                                -- Cond TDD-OR
    nonCriticalExtension
                                            SystemInformationBlockType1-v1530-IEs
    OPTIONAL
}
SystemInformationBlockType1-v1530-IEs ::= SEQUENCE {
   hsdn-Cell-r15
   cellSelectionInfoCE-v1530
                                       ENUMERATED {true}
                                                                   OPTIONAL,
                                                                                -- Need OR
                                       CellSelectionInfoCE-v1530 OPTIONAL, -- Need OP
    crs-IntfMitigConfig-r15
                                       CHOICE {
        -IntIMitigConfig-r15
crs-IntfMitigEnabled-15
crs-IntfMitigNumPRBs-r15
                                       NULL,
                                           ENUMERATED {n6, n24}
   PLMN-IdentityList-v1530 OPTIONAL,
PosSchedulingInfoList-r15 OPTIONAL,
                                                                                -- Need OR
                                                                                -- Need OR
       cellAccessRelatedInfoList-5GC-r15 SEQUENCE (SIZE (1..maxPLMN-r11)) OF
                                            CellAccessRelatedInfo-5GC-r15
    } OPTIONAL, -- Need OP
ims-EmergencySupport5GC-r15 ENUMERATED {true}
eCallOverIMS-Support5GC-r15 ENUMERATED {true}
                                                                   OPTIONAL,
                                                                                -- Need OR
                                       ENUMERATED {true} OPTIONAL,
ENUMERATED {true} OPTIONAL,
                                                                               -- Need OR
    nonCriticalExtension
                                       SystemInformationBlockType1-v1540-IEs
                                                                                    OPTTONAL.
}
SystemInformationBlockType1-v1540-IEs ::= SEQUENCE {
                                                   ENUMERATED {true} OPTIONAL, -- Need ON
   si-posOffset-r15
```

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```
nonCriticalExtension
                                                   SEQUENCE { } OPTIONAL
}
PLMN-IdentityList ::=
                                       SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo
PLMN-IdentityInfo ::=
                                      SEQUENCE {
                                           PLMN-Identity,
   plmn-Identity
    cellReservedForOperatorUse
                                           ENUMERATED {reserved, notReserved}
}
PLMN-IdentityList-v1530 ::=
                                      SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-v1530
PLMN-IdentityInfo-v1530 ::=
                                       SEQUENCE {
   cellReservedForOperatorUse-CRS-r15
                                        ENUMERATED {reserved, notReserved}
}
PLMN-IdentityList-r15::=
                                  SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-r15
PLMN-IdentityInfo-r15 ::=
                                 SEQUENCE {
   plmn-Identity-5GC-r15
                                   CHOICE {
       plmn-Identity-r15
                                        PLMN-Identity,
       plmn-Index-r15
                                          INTEGER (1..maxPLMN-r11)
    },
   cellReservedForOperatorUse-r15
                                         ENUMERATED {reserved, notReserved},
   cellReservedForOperatorUse-CRS-r15
                                         ENUMERATED {reserved, notReserved}
}
SchedulingInfoList ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo
SchedulingInfo ::= SEQUENCE {
    si-Periodicity
                               ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},
    sib-MappingInfo
                               SIB-MappingInfo
}
SchedulingInfoList-BR-r13 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo-BR-r13
SchedulingInfo-BR-r13 ::= SEQUENCE {
   si-Narrowband-r13
                           INTEGER (1..maxAvailNarrowBands-r13),
                           ENUMERATED {b152, b208, b256, b328, b408, b504, b600, b712, b808, b936}
    si-TBS-r13
}
SIB-MappingInfo ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type
SIB-Type ::=
                                   ENUMERATED {
                                       sibType3, sibType4, sibType5, sibType6,
                                       sibType7, sibType8, sibType9, sibType10,
sibType11, sibType12-v920, sibType13-v920,
                                       sibType14-v1130, sibType15-v1130,
                                       sibType16-v1130, sibType17-v1250, sibType18-v1250,
                                       ..., sibType19-v1250, sibType20-v1310, sibType21-v1430,
                                       sibType24-v1530, sibType25-v1530, sibType26-v1530}
SystemInfoValueTagList-r13 ::=
                                   SEQUENCE (SIZE (1..maxSI-Message)) OF SystemInfoValueTagSI-r13
SystemInfoValueTaqSI-r13 ::=
                                  INTEGER (0..3)
CellSelectionInfo-v920 ::=
                                   SEQUENCE {
                                      Q-QualMin-r9,
   q-QualMin-r9
   q-QualMinOffset-r9
                                       INTEGER (1..8)
                                                                         OPTIONAL
                                                                                    -- Need OP
}
CellSelectionInfo-v1130 ::=
                                   SEQUENCE {
  q-QualMinWB-r11
                                      Q-QualMin-r9
}
CellSelectionInfo-v1250 ::=
                                  SEQUENCE {
   q-QualMinRSRQ-OnAllSymbols-r12 Q-QualMin-r9
}
CellAccessRelatedInfo-r14 ::= SEQUENCE {
   plmn-IdentityList-r14
                                     PLMN-IdentityList,
    trackingAreaCode-r14
                                       TrackingAreaCode,
                                      CellIdentity
   cellIdentity-r14
}
CellAccessRelatedInfo-5GC-r15 ::= SEQUENCE {
   plmn-IdentityList-r15
                                   PLMN-IdentityList-r15,
                                      RAN-AreaCode-r15 OPTIONAL, -- Need OR
   ran-AreaCode-r15
```

```
trackingAreaCode-5GC-r15
                                          TrackingAreaCode-5GC-r15,
    cellIdentity-5GC-r15
                                           CellIdentity-5GC-r15
}
CellIdentity-5GC-r15 ::= CHOICE{
   cellIdentity-r15 CellIdentity,
cellId-Index-r15 INTEGER (1..maxPLMN-r11)
}
PosSchedulingInfoList-r15 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF PosSchedulingInfo-r15
PosSchedulingInfo-r15 ::= SEQUENCE {
    posSI-Periodicity-r15 ENUMER

                             ENUMERATED {rf8, rf16, rf32, rf64, rf128, rf256, rf512},
    posSIB-MappingInfo-r15
                                 PosSIB-MappingInfo-r15
}
PosSIB-MappingInfo-r15 ::= SEQUENCE (SIZE (1..maxSIB)) OF PosSIB-Type-r15
PosSIB-Type-r15 ::= SEQUENCE {
                                                           OPTIONAL, -- Need OP
OPTIONAL, -- Need OP
    encrypted-r15 ENUMERATED { true }
    gnss-id-r15
                         GNSS-ID-r15
    sbas-id-r15 SBAS-ID-r15
posSibType-r15 ENUMERATED {
                                         posSibType1-1,
                                          posSibType1-2,
                                           posSibType1-3,
                                           posSibType1-4,
                                          posSibType1-5,
                                           posSibType1-6,
                                           posSibType1-7,
                                           posSibType2-1,
                                           posSibType2-2,
                                           posSibType2-3,
                                           posSibType2-4,
                                           posSibType2-5,
                                           posSibType2-6,
                                           posSibType2-7,
                                           posSibType2-8,
                                           posSibType2-9,
                                           posSibType2-10,
                                           posSibType2-11,
                                           posSibType2-12,
                                           posSibType2-13,
                                           posSibType2-14,
                                           posSibType2-15,
                                           posSibType2-16,
                                           posSibType2-17,
                                           posSibType2-18,
                                           posSibType2-19,
                                           posSibType3-1,
                                           ...},
    . . .
}
-- ASN1STOP
```

SystemInformationBlockType1 field	descriptions
bandwithReducedAccessRelatedInfo	
Access related information for BL UEs and UEs in CE. NOTE 3.	
category0Allowed	
The presence of this field indicates category 0 UEs are allowed to access	ss the cell.
cellAccessRelatedInfoList	
This field contains a list allowing signalling of access related information	n per PLMN. One PLMN can be included in
only one entry of this list. NOTE 4.	
cellAccessRelatedInfoList-5GC This field contains a PLMN list and a list allowing signalling of access re	Nated information per PLMNI for PLMNIs that
provides connectivity to 5GC. One PLMN can be included in only one e	
cellBarred, cellBarred-CRS	
barred means the cell is barred, as defined in TS 36.304 [4].	
cellBarred-5GC, cellBarred-5GC-CRS	
barred means the cell is barred for connectivity to 5GC, as defined in TS	S 36.304 [4].
cellIdentity	
Indicates the cell identity. NOTE 2.	
cellid-index	
the index of the cell ID in the PLMN lists for EPC, indicates UE the corre	
indicates the cell ID of the 1st PLMN list for EPC in the SIB1. Value 2 in	dicates the cell ID of the 2nd PLMN list for
EPC, and so on. cellReservedForOperatorUse, cellReservedForOperatorUse-CRS	
As defined in TS 36.304 [4].	
cellSelectionInfoCE	
Cell selection information for BL UEs and UEs in CE. If absent, coverage	e enhancement S criteria is not applicable
NOTE 3.	
cellSelectionInfoCE1	
Cell selection information for BL UEs and UEs in CE supporting CE Mod	de B. E-UTRAN includes this IE only if
cellSelectionInfoCE is present in SystemInformationBlockType1-BR. NO	DTE 3.
crs-IntfMitigConfig	
crs-IntfMitigEnabled indicates CRS interference mitigation is enabled fo	
clause 3.6.1.1. For BL UEs or UEs in CE supporting <i>ce-CRS-IntfMitig</i> , p	
CRS interference mitigation is enabled in the cell, as specified in TS 36 value of crs-IntfMitigNumPRBs indicates number of PRBs, i.e. 6 or 24 F	
BW when CRS interference mitigation is enabled. For UEs not supportin	
this field is configured and the field <i>cellBarred</i> in SystemInformationBloc	
BL UEs or UEs in CE) is set to <i>notbarred</i> .	
csg-Identity	
Identity of the Closed Subscriber Group the cell belongs to.	
csg-Indication	
If set to TRUE the UE is only allowed to access the cell if it is a CSG me	ember cell, if selected during manual CSG
selection or to obtain limited service, see TS 36.304 [4].	
eCallOverIMS-Support	
Indicates whether the cell supports eCall over IMS services via EPC for	
eCall over IMS via EPC is not supported by the network in the cell. NOT eCallOverIMS-Support5GC	IE 2.
Indicates whether the cell supports eCall over IMS services via 5GC as	defined in TS 23 401 [41] If absent eCall over
IMS via 5GC is not supported by the network in the cell. NOTE 2.	
eDRX-Allowed	
The presence of this field indicates if idle mode extended DRX is allowed	ed in the cell. The UE shall stop using extended
DRX in idle mode if <i>eDRX-Allowed</i> is not present.	1 0
encrypted	
The presence of this field indicates that the posSibType is encrypted as	specified in TS 36.355 [54].
fdd-DownlinkOrTddSubframeBitmapBR	
The set of valid subframes for FDD downlink or TDD transmissions, see	
If this field is present, SystemInformationBlockType1-BR-r13 is transmit	
RRCConnectionReconfiguration does not include systemInformationBlo subframes in fdd-DownlinkOrTddSubframeBitmapBR are not indicated a	
present, the set of valid subframes is the set of non-MBSFN subframes	
neither this field nor <i>mbsfn-SubframeConfigList</i> is present, all subframe	
downlink transmission, all DL subframes according to the uplink-downline	
considered as valid subframes for TDD DL transmission, and all UL sub	
configuration (see TS 36.211 [21]) are considered as valid subframes for	
The first/leftmost bit corresponds to the subframe #0 of the radio frame	satisfying SFN mod $x = 0$, where x is the size
af the drift states with deal by AO Malves O in the drifteness in disease that the	orresponding subframe is invalid for
of the bit string divided by 10. Value 0 in the bitmap indicates that the co transmission. Value 1 in the bitmap indicates that the corresponding sul	

SystemInformationBlockType1 field descriptions
fdd-UplinkSubframeBitmapBR
The set of valid subframes for FDD uplink transmissions for BL UEs, see TS 36.213 [23].
If the field is not present, then UE considers all uplink subframes as valid subframes for FDD uplink transmissions.
The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod $x = 0$, where x is the size
of the bit string divided by 10. Value 0 in the bitmap indicates that the corresponding subframe is invalid for
transmission. Value 1 in the bitmap indicates that the corresponding subframe is valid for transmission.
freqBandIndicatorPriority
If the field is present and supported by the UE, the UE shall prioritize the frequency bands in the <i>multiBandInfoList</i>
field in decreasing priority order. Only if the UE does not support any of the frequency band in <i>multiBandInfoList</i> , the
UE shall use the value in <i>freqBandIndicator</i> field. Otherwise, the UE applies frequency band according to the rules
defined in <i>multiBandInfoList</i> . NOTE 2.
freqBandInfo
A list of additionalPmax and additionalSpectrumEmission values, as defined in TS 36.101 [42], table 6.2.4-1, for UEs
neither in CE nor BL UEs and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, for the frequency band in
freqBandIndicator. If E-UTRAN includes freqBandInfo-v10l0 it includes the same number of entries, and listed in the
same order, as in freqBandInfo-r10.
freqHoppingParametersDL
Downlink frequency hopping parameters for BR versions of SI messages, MPDCCH/PDSCH of paging,
MPDCCH/PDSCH of RAR/Msg4 and unicast MPDCCH/PDSCH. If not present, the UE is not configured downlink
frequency hopping.
gnss-ID
The presence of this field indicates that the <i>posSibType</i> is for a specific GNSS.
hsdn-Cell
This field indicates this is a HSDN cell as specified in TS 36.304 [4].
hyperSFN
Indicates hyper SFN which increments by one when the SFN wraps around.
ims-EmergencySupport
Indicates whether the cell supports IMS emergency bearer services via EPC for UEs in limited service mode. If
absent, IMS emergency call via EPC is not supported by the network in the cell for UEs in limited service mode. NOTE
2.
ims-EmergencySupport5GC
Indicates whether the cell supports IMS emergency bearer services for UEs in limited service mode via 5GC. If
absent, IMS emergency call via 5GC is not supported by the network in the cell for UEs in limited service mode. NOTE
2.
intraFreqReselection
Used to control cell reselection to intra-frequency cells when the highest ranked cell is barred, or treated as barred by
the UE, as specified in TS 36.304 [4]. NOTE 2.
multiBandInfoList
A list of additional frequency band indicators, as defined in TS 36.101 [42], table 5.5-1, that the cell belongs to. If the
UE supports the frequency band in the freqBandIndicator field it shall apply that frequency band. Otherwise, the UE
shall apply the first listed band which it supports in the <i>multiBandInfoList</i> field. If E-UTRAN includes <i>multiBandInfoList</i> -
<i>v9e0</i> it includes the same number of entries, and listed in the same order, as in <i>multiBandInfoList</i> (i.e. without suffix).
See Annex D for more descriptions. The UE shall ignore the rule defined in this field description if
freqBandIndicatorPriority is present and supported by the UE.
multiBandInfoList-v10j0
A list of additionalPmax and additionalSpectrumEmission values, as defined in TS 36.101 [42], table 6.2.4-1, for UEs
neither in CE nor BL UEs and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, for the frequency bands in
multiBandInfoList (i.e. without suffix) and multiBandInfoList-v9e0. If E-UTRAN includes multiBandInfoList-v10j0, it
includes the same number of entries, and listed in the same order, as in <i>multiBandInfoList</i> (i.e. without suffix). If E-
UTRAN includes <i>multiBandInfoList-v10l0</i> it includes the same number of entries, and listed in the same order, as in
multiBandInfoList-v10j0.
plmn-IdentityList
List of PLMN identities. The first listed <i>PLMN-Identity</i> is the primary PLMN. If <i>plmn-IdentityList-v1530</i> is included, E-
UTRAN includes the same number of entries, and listed in the same order, as in <i>plmn-IdentityList</i> (without suffix).
NOTE 2.
plmn-index
Index of the PLMN in the <i>plmn-IdentityList</i> fields included in SIB1for EPC, indicating the same PLMN ID is connected
to 5GC too. 1 if the 1st PLMN is from the 1st plmn-ldentityList included in SIB1, 2 if the 2nd PLMN is from the same
plmn-Identityl ist, or when no more PLMN are present within the same plmn-Identityl ist, then the PLMN listed 1st in
<i>plmn-IdentityList</i> , or when no more PLMN are present within the same <i>plmn-IdentityList</i> , then the PLMN listed 1st in the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on NOTE 6
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6.
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i>
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i> Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i> Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2. NOTE 2.
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i> Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i> Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2. NOTE 2.
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i> Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2. NOTE 2. <i>posSIB-MappingInfo</i> List of the posSIBs mapped to this <i>SystemInformation</i> message.
the subsequent <i>plmn-IdentityList</i> within the same SIB1 and so on. NOTE 6. <i>p-Max</i> Value applicable for the cell. If absent the UE applies the maximum power according to its capability as specified in TS 36.101 [42], clause 6.2.2. NOTE 2. <i>posSIB-MappingInfo</i>

q-QualMin	SystemInformationBlockType1 field descriptions
-	304 [4]. If <i>cellSelectionInfo-v920</i> is not present, the UE applies the (default) value of OTE 1.
q-QualMinRSRQ-OnAllSym	
	ported by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ measurements, perform RSRQ mbols in accordance with TS 36.214 [48]. NOTE 1.
q-QualMinOffset	
	36.304 [4]. Actual value $Q_{qualminoffset}$ = field value [dB]. If <i>cellSelectionInfo-v920</i> is not ent, the UE applies the (default) value of 0 dB for $Q_{qualminoffset}$. Affects the minimum
q-QualMinWB	
	ported by the UE, the UE shall, when performing RSRQ measurements, use a wider TS 36.133 [16]. NOTE 1.
q-RxLevMinOffset	
(default) value of 0 dB for Qrxle	6.304 [4]. Actual value Q _{rxlevminoffset} = field value * 2 [dB]. If absent, the UE applies the evminoffset. Affects the minimum required Rx level in the cell.
sbas-ID The presence of this field indi	potes that the $negSibTure is for a specific SPAS$
sib-MappingInfo	cates that the <i>posSibType</i> is for a specific SBAS.
List of the SIBs mapped to thi	s SystemInformation message. There is no mapping information of SIB2; it is always ormation message listed in the schedulingInfoList list.
si-HoppingConfigCommon	¥
Frequency hopping activation	/deactivation for BR versions of SI messages and MPDCCH/PDSCH of paging.
si-Narrowband	
TS 36.211 [21], clause 6.4.1 a	of a narrowband used to broadcast the SI message towards BL UEs and UEs in CE, see and TS 36.213 [23], clause 7.1.6. Field values (1 <i>maxAvailNarrowBands-r13</i>) lices (0[<i>maxAvailNarrowBands-r13</i> -1]) as specified in TS 36.211 [21].
si-RepetitionPattern	
Indicates the radio frames wit every radio frame, value ever	hin the SI window used for SI message transmission. Value everyRF corresponds to y2ndRF corresponds to every 2 radio frames, and so on. The first transmission of the SI
	he first radio frame of the SI window.
si-Periodicity, posSI-Period	<i>icrty</i> in radio frames, such that rf8 denotes 8 radio frames, rf16 denotes 16 radio frames, and
	nfigured, the posSI-Periodicity of rf8 cannot be used.
si-posOffset	
This field, if present and set to	<i>true</i> indicates that the SI messages in <i>PosSchedulingInfoList</i> are scheduled with an ared to SI messages in <i>SchedulingInfoList</i> . <i>si-posOffset</i> may be present only if the
	ge periodicity for SI messages in SchedulingInfoList is 80ms.
si-TBS	
CE, see TS 36.213 [23], Table	ort block size information used to broadcast the SI message towards BL UEs and UEs ir e 7.1.7.2.1-1, for a 6 PRB bandwidth and a QPSK modulation.
schedulingInfoList-BR	
entries, and listed in the same	g information of SI messages for BL UEs and UEs in CE. It includes the same number of order, as in <i>schedulingInfoList</i> (without suffix).
si-ValidityTime	validity timer. If set to TRUE, the timer is set to 3h, otherwise the timer is set to 24h.
si-WindowLength, si-Windo	
Common SI scheduling windo milliseconds and so on. In cas shall use si-WindowLength-Bi	w for all SIs. Unit in milliseconds, where ms1 denotes 1 millisecond, ms2 denotes 2 se s <i>i-WindowLength-BR-r13</i> is present and the UE is a BL UE or a UE in CE, the UE <i>R-r13</i> and ignore the original field <i>si-WindowLength</i> (without suffix). UEs other than BL the extension field s <i>i-WindowLength-BR-r13</i> .
	ndicates the OFDM starting symbol for any MPDCCH, PDSCH scheduled on the same ng SystemInformationBlockType1-BR, see TS 36.213 [23]. Values 1, 2, and 3 are
	eater than 10 resource blocks. Values 2, 3, and 4 are applicable otherwise.
systemInfoValueTagList	
Indicates SI message specific in the same order, as in <i>sche</i> e	value tags for BL UEs and UEs in CE. It includes the same number of entries, and liste dulingInfoList (without suffix).
MIB, SIB1, SIB10, SIB11, SIB	as specified in clause 5.2.1.3. Common for all SIBs within the SI message other than 12 and SIB14.
	an MIB, MIB-MBMS, SIB1, SIB1-MBMS, SIB10, SIB11, SIB12 and SIB14. Change of IB1-MBMS is detected by acquisition of the corresponding message.
tdd-Config	
Specifies the TDD specific ph	ysical channel configurations. NOTE 2.

SystemInformationBlockType1 field descriptions		
trackingAreaCode/trackingAreaCode-5GC		
A trackingAreaCode that is common for all the PLMNs listed. NOTE2. NOTE 5.		

NOTE 1: The value the UE applies for parameter "Q_{qualmin}" in TS 36.304 [4] depends on the *q*-QualMin fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

q-QualMinRSRQ-OnAllSymbols	q-QualMinWB	Value of parameter "Q _{qualmin} " in TS 36.304 [4]
Included	Included	q-QualMinRSRQ-OnAllSymbols – (q-QualMin – q-
		QualMinWB)
Included	Not included	q-QualMinRSRQ-OnAllSymbols
Not included	Included	q-QualMinWB
Not included	Not included	q-QualMin

- NOTE 2: E-UTRAN sets this field to the same value for all instances of SIB1 message that are broadcasted within the same cell.
- NOTE 3: E-UTRAN configures this field only in the BR version of SIB1 message.
- NOTE 4: E-UTRAN configures at most 6 EPC PLMNs in total (i.e. across all the PLMN lists except for PLMN lists in *cellAccessRelatedInfoList-5GC* in SIB1). E-UTRAN configures at most 6 5GC PLMNs in total (i.e. across all the PLMN lists in *cellAccessRelatedInfoList-5GC* in SIB1).
- NOTE 5: E-UTRAN configures only one value for this parameter per PLMN.
- NOTE 6: E-UTRAN configures *plmn-index* only if the *cellBarred* is set to *notBarred*

Conditional presence	Explanation
BW-reduced	The field is optional present, Need OR, if <i>schedulingInfoSIB1-BR</i> in MIB is set to a value
	greater than 0. Otherwise the field is not present.
FBI-max	The field is mandatory present if <i>freqBandIndicator</i> (i.e. without suffix) is set to <i>maxFBI</i> .
	Otherwise the field is not present.
mFBI	The field is optional present, Need OR, if <i>multiBandInfoList</i> is present. Otherwise the field
	is not present.
mFBI-max	The field is mandatory present if one or more entries in <i>multiBandInfoList</i> (i.e. without
	suffix, introduced in -v8h0) is set to maxFBI. Otherwise the field is not present.
RSRQ	The field is mandatory present if SIB3 is being broadcast and threshServingLowQ is
	present in SIB3; otherwise optionally present, Need OP.
RSRQ2	The field is mandatory present if <i>q</i> -QualMinRSRQ-OnAllSymbols is present in SIB3;
	otherwise it is not present and the UE shall delete any existing value for this field.
Hopping	The field is mandatory present if <i>si-HoppingConfigCommon</i> field is broadcasted and set
	to on. Otherwise the field is optionally present, need OP.
QrxlevminCE1	The field is optionally present, Need OR, if <i>q-RxLevMinCE1-r13</i> is set below -140 dBm.
	Otherwise the field is not present.
TDD	This field is mandatory present for TDD; it is not present for FDD and the UE shall delete
	any existing value for this field.
TDD-OR	The field is optional present for TDD, need OR; it is not present for FDD.
WB-RSRQ	The field is optionally present, need OP if the measurement bandwidth indicated by
	allowedMeasBandwidth in systemInformationBlockType3 is 50 resource blocks or larger;
	otherwise it is not present.
SI-BR	The field is mandatory present if schedulingInfoSIB1-BR is included in MIB with a value
	greater than 0. Otherwise the field is not present.

SystemInformationBlockType1-MBMS

SystemInformationBlockType1-MBMS contains information relevant for receiving service from MBMS-dedicated cell and defines the scheduling of other system information.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channels: BCCH

Direction: E-UTRAN to UE

SystemInformationBlockType1-MBMS message

-- ASN1START

SystemInformationBlockType1-MBMS-r14 ::= SEQUENCE { cellAccessRelatedInfo-r14 SEQUENCE PLMN-IdentityList-MBMS-r14, plmn-IdentityList-r14 trackingAreaCode-r14 TrackingAreaCode, cellIdentity-r14 CellIdentity fregBandIndicator-r14 FreqBandIndicator-r11, multiBandInfoList-r14 MultiBandInfoList-r11 OPTIONAL, -- Need OR schedulingInfoList-MBMS-r14 SchedulingInfoList-MBMS-r14, si-WindowLength-r14 ENUMERATED ms1, ms2, ms5, ms10, ms15, ms20, ms40, ms80}, systemInfoValueTag-r14 INTEGER (0..31), nonMBSFN-SubframeConfig-r14 NonMBSFN-SubframeConfig-r14 OPTIONAL, --Need OR pdsch-ConfigCommon-r14 PDSCH-ConfigCommon, systemInformationBlockType13-r14SystemInformationBlockType13-r9 OFcellAccessRelatedInfoList-r14SEQUENCE (SIZE (1..maxPLMN-1-r14)) OF SystemInformationBlockType13-r9 OPTIONAL, --Need OR CellAccessRelatedInfo-r14 OPTIONAL, -- Need OR nonCriticalExtension SEQUENCE { } OPTIONAL } PLMN-IdentityList-MBMS-r14 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-Identity SchedulingInfoList-MBMS-r14 ::= SEQUENCE (SIZE (1..maxSI-Message)) OF SchedulingInfo-MBMS-r14 SchedulingInfo-MBMS-r14 ::= SEQUENCE { si-Periodicity-r14 ENUMERATED { rf16, rf32, rf64, rf128, rf256, rf512}, sib-MappingInfo-r14 SIB-MappingInfo-MBMS-r14 } SIB-MappingInfo-MBMS-r14 ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type-MBMS-r14 SIB-Type-MBMS-r14 ::= ENUMERATED { sibType10, sibType11, sibType12-v920, sibType13-v920, sibType15-v1130, sibType16-v1130, ...} NonMBSFN-SubframeConfig-r14 ::= SEQUENCE { MBSFN-SubframeConfig-r14 ::= radioFrameAllocationPeriod-r14 radioFrameAllocationOffset-r14 ENUMERATED {rf4, rf8, rf16, rf32, rf64, rf128, rf512}, INTEGER (0..7), subframeAllocation-r14 BIT STRING (SIZE(9)) } -- ASN1STOP

SystemInformationBlockType1-MBMS field descriptions	
cellAccessRelatedInfoList	
This field contains a list allowing signalling of access related information per PLMN. One P only one entry of this list. NOTE 2.	'LMN can be included in
cellIdentity	
Indicates the cell identity. NOTE 1.	
freqBandIndicator	
A list of as defined in TS 36.101 [42], table 6.2.4-1, for the frequency band in freqBandIndi	cator.
<i>multiBandInfoList</i> A list of additional frequency band indicators, as defined in TS 36.101 [42], table 5.5-1, tha UE supports the frequency band in the <i>freqBandIndicator</i> field it shall apply that frequency shall apply the first listed band which it supports in the <i>multiBandInfoList</i> field.	
nonMBSFN-SubframeConfig	
Defines the non-MBSFN subframes within the radio frame allocation period defined by the radioFrameAllocationPeriod and the radioFrameAllocationOffset.	
plmn-IdentityList	
List of PLMN identities. The first listed PLMN-Identity is the primary PLMN. NOTE 1.	
radioFrameAllocationPeriod, radioFrameAllocationOffset	
Radio-frames that contain non-MBSFN subframes occur when equation SFN mod radioFra radioFrameAllocationOffset is satisfied. Value rf4 for radioframeAllocationPeriod denotes 4	
radion frames, and so on.	
schedulingInfoList-MBMS	
Indicates additional scheduling information of SI messages on MBMS-dedicated cell.	
<i>sib-MappingInfo</i> List of the SIBs mapped to this <i>SystemInformation</i> message.	
si-Periodicity	
Periodicity of the SI-message in radio frames, such that rf16 denotes 16 radio frames, rf32 and so on.	denotes 32 radio frames,
si-WindowLength	
Common SI scheduling window for all SIs. Unit in milliseconds, where ms1 denotes 1 millis milliseconds and so on.	second, ms2 denotes 2
subframeAllocation	
Defines the subframes that are allocated for non-MBSFN within the radio frame allocation radioFrameAllocationPeriod and the radioFrameAllocationOffset. "0" denotes that the corresponding subframe is a non-MBSFN subframe value other than "0" for additionalNonMBSFNSubframes within MasterInformationBlock-Mic configuration should also indicate subframes pointed out by additionalNonMBSFNSubframe subframes.	esponding subframe is a e. If E-UTRAN configures a BMS, subframeAllocation
systemInformationBlockType13 E-UTRAN does not configure this field if schedulingInfoList–MBMS indicates that SystemIn present.	nformationBlockType13 is
systemInfoValueTag	
Common for all SIBs other than MIB, SIB1, SIB10, SIB11, SIB12 and SIB14. Change of M acquisition of the corresponding message.	IB and SIB1 is detected by
trackingAreaCode	
A <i>trackingAreaCode</i> that is common for all the PLMNs listed. NOTE1.	

NOTE 1: E-UTRAN sets this field to the same value for all instances of SIB1-MBMS message that are broadcasted within the same cell.

UEAssistanceInformation

The UEAssistanceInformation message is used for the indication of UE assistance information to the eNB.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

UEAssistanceInformation message

-- ASN1START

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UEAssistanceInformation-r11 ::= SEQUENCE { criticalExtensions CHOICE { c1 CHOICE { ueAssistanceInformation-r11 UEAssistanceInformation-r11-IEs, spare3 NULL, spare2 NULL, spare1 NULL }, SEQUENCE { } criticalExtensionsFuture } } UEAssistanceInformation-r11-IEs ::= SEQUENCE { powerPrefIndication-r11 ENUMERATED {normal, lowPowerConsumption} OPTIONAL. OPTIONAL, lateNonCriticalExtension OCTET STRING nonCriticalExtension UEAssistanceInformation-v1430-IEs OPTIONAL } UEAssistanceInformation-v1430-IEs ::= SEQUENCE { bw-Preference-r14 BW-Preference-r14 OPTIONAL, sps-AssistanceInformation-r14 SEQUENCE { trafficPatternInfoListSL-r14 trafficPatternInfoListUL-r14 TrafficPatternInfoList-r14 OPTIONAL, TrafficPatternInfoList-r14 OPTIONAL OPTIONAL, rlm-Report-r14 SEQUENCE { rlm-Event-r14 ENUMERATED {earlyOutOfSync, earlyInSync}, excessRep-MPDCCH-r14 ENUMERATED {excessRep1, excessRep2} OPTIONAL OPTIONAL, delayBudgetReport-r14 DelayBudgetReport-r14 OPTIONAL, UEAssistanceInformation-v1450-IEs nonCriticalExtension OPTIONAL } UEAssistanceInformation-v1450-IEs ::= SEQUENCE { overheatingAssistance-r14 OverheatingAssistance-r14 OPTIONAL, UEAssistanceInformation-v1530-IEs nonCriticalExtension OPTIONAL } UEAssistanceInformation-v1530-IEs ::= SEQUENCE { SEQUENCE { sps-AssistanceInformation-v1530 trafficPatternInfoListSL-v1530 TrafficPatternInfoList-v1530 OPTIONAL, OPTIONAL nonCriticalExtension SEQUENCE { } } BW-Preference-r14 ::= SEQUENCE { dl-Preference-r14 ENUMERATED {mhz1dot4, mhz5, mhz20 } ul-Preference-r14 ENUMERATED {mhz1dot4, mhz5} OPTIONAL, OPTIONAL } TrafficPatternInfoList-r14 ::= SEQUENCE (SIZE (1..maxTrafficPattern-r14)) OF TrafficPatternInfo-r14 TrafficPatternInfo-r14 ::= SEQUENCE { trafficPeriodicity-r14 ENUMERATED { sf20, sf50, sf100, sf200, sf300, sf400, sf500, sf600, sf700, sf800, sf900, sf1000}, timingOffset-r14 INTEGER (0..10239), SL-Priority-r13 priorityInfoSL-r14 OPTIONAL, logicalChannelIdentityUL-r14 INTEGER (3..10) OPTIONAL, messageSize-r14 BIT STRING (SIZE (6)) } TrafficPatternInfoList-v1530 ::= SEQUENCE (SIZE (1..maxTrafficPattern-r14)) OF TrafficPatternInfov1530 TrafficPatternInfo-v1530 ::= SEQUENCE { SL-DestinationIdentity-r12 trafficDestination-r15 OPTIONAL. reliabilityInfoSL-r15 SL-Reliability-r15 OPTIONAL } CHOICE { DelayBudgetReport-r14::= ENUMERATED { type1 msMinus1280, msMinus640, msMinus320, msMinus160, msMinus80, msMinus60, msMinus40, msMinus20, ms0, ms20, ms40, ms60, ms80, ms160, ms320, ms640, ms1280}, type2 ENUMERATED { msMinus192, msMinus168,msMinus144, msMinus120, msMinus96, msMinus72, msMinus48, msMinus24, ms0, ms24, ms48, ms72, ms96, ms120, ms144, ms168, ms192}

OverheatingAssistance-r14 ::= SEQ	QUENCE {	
reducedUE-Category	SEQUENCE {	
reducedUE-CategoryDL	INTEGER	(019),
reducedUE-CategoryUL	INTEGER	(021)
} OPTIONAL,		
reducedMaxCCs	SEQUENCE {	
reducedCCsDL	INTEGER	(031),
reducedCCsUL	INTEGER	(031)
} OPTIONAL		
}		

-- ASN1STOP

UEAssistanceInformation field descriptions	
delayBudgetReport	
ndicates the UE-preferred adjustment to connected mode DRX or coverage enhancement configuration.	
<i>dI-Preference</i> ndicates UE's preference on configuration of maximum PDSCH bandwidth. The value mhz1dot4 corresponds to node usage in 1.4MHz bandwidth, mhz5 corresponds to CE mode usage in 5MHz bandwidth, and mhz20) CE
corresponds to CE mode usage in 20MHz bandwidth or normal coverage.	
excessRep-MPDCCH ndicates the excess number of repetitions on MPDCCH. Value excessRep1 and excessRep2 indicate the exces number of repetitions defined in TS 36.133 [16].	s
logicalChannelldentityUL	
ndicates the logical channel identity associated with the reported traffic pattern in the uplink logical channel.	
<i>messageSize</i> ndicates the maximum TB size based on the observed traffic pattern. The value refers to the index of TS 36.321 able 6.1.3.1-1.	[6],
powerPrefIndication	
/alue lowPowerConsumption indicates the UE prefers a configuration that is primarily optimised for power saving	q.
Otherwise the value is set to normal.	0
priorityInfoSL	
ndicates the traffic priority (i.e., PPPP) associated with the reported traffic pattern for V2X sidelink communication	on.
reducedCCsDL	
ndicates the UE's preference on reduced configuration corresponding to the maximum number of downlink SCe ndicated by the field, to address overheating. This maximum number includes both SCells of E-UTRA and PSCell/SCells of NR in (NG)EN-DC.	lls
reducedCCsUL	
ndicates the UE's preference on reduced configuration corresponding to the maximum number of uplink SCells ndicated by the field, to address overheating. This maximum number includes both SCells of E-UTRA and PSCell/SCells of NR in (NG)EN-DC.	
reducedUE-CategoryDL, reducedUE-CategoryUL	
ndicates that UE prefers a configuration corresponding to the reduced UE category, to address overheating. The reduced UE DL category and reduced UE UL category should be indicated according to supported combinations JE UL and DL Categories, see TS 36.306 [5], Table 4.1A-6.	
reliabilityInfoSL	
ndicates the traffic reliability (i.e., PPPR) associated with the reported traffic pattern for V2X sidelink communica	ition.
rlm-Event	
This field provides the RLM event ("early-out-of-sync" or "early-in-sync").	
rlm-Report	
This field provides the RLM report for BL UEs and UEs in CE.	
sps-AssistanceInformation ndicates the UE assistance information to assist E-UTRAN to configure SPS. timingOffset	
This field indicates the estimated timing for a packet arrival in a SL/UL logical channel. Specifically, the value ind he timing offset with respect to subframe#0 of SFN#0 in milliseconds.	icates
trafficDestination	
ndicates the destination associated with the reported traffic pattern for V2X sidelink communication.	
trafficPatternInfoListSL This field provides the traffic characteristics of sidelink logical channel(s) that are setup for V2X sidelink communication. If trafficPatternInfoListSL-v1530 is included, it includes the same number of entries, and listed in same order, as in trafficPatternInfoListSL-r14.	the
trafficPatternInfoListUL	
This field provides the traffic characteristics of uplink logical channel(s).	
trafficPeriodicity	
This field indicates the estimated data arrival periodicity in a SL/UL logical channel. Value sf20 corresponds to 20 sf50 corresponds to 50 ms and so on.) ms,
type1 ndicates the preferred amount of increment/decrement to the connected mode DRX cycle length with respect to current configuration. Value in number of milliseconds. Value ms40 corresponds to 40 milliseconds, msMinus40 corresponds to -40 milliseconds and so on.	the
type2 ndicates the preferred amount of increment/decrement to the coverage enhancement configuration with respect current configuration so that the Uu air interface delay changes by the indicated amount. Value in number of milliseconds. Value ms24 corresponds to 24 milliseconds, msMinus24 corresponds to -24 milliseconds and so or	
ul-Preference ndicates UE's preference on configuration of maximum PUSCH bandwidth. The value mhz1dot4 corresponds to node usage in 1.4MHz bandwidth, and mhz5 corresponds to CE mode usage in 5MHz bandwidth.) CE

UECapabilityEnquiry

The *UECapabilityEnquiry* message is used to request the transfer of UE radio access capabilities for E-UTRA as well as for other RATs.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

UECapabilityEnquiry message

```
-- ASN1START
```

_

<pre>UECapabilityEnquiry ::= rrc-TransactionIdentifier criticalExtensions c1 ueCapabilityEnquiry-r8 spare3 NULL, spare2 NUL }, criticalExtensionsFuture } }</pre>	SEQUENCE { RRC-TransactionIdentifier, CHOICE { UECapabilityEnquiry-r8-IEs, L, sparel NULL SEQUENCE {}	
UECapabilityEnquiry-r8-IEs ::= ue-CapabilityRequest nonCriticalExtension }	SEQUENCE { UE-CapabilityRequest, UECapabilityEnquiry-v8a0-IEs	OPTIONAL
<pre>UECapabilityEnquiry-v8a0-IEs ::= lateNonCriticalExtension nonCriticalExtension }</pre>	SEQUENCE { OCTET STRING UECapabilityEnquiry-v1180-IEs	OPTIONAL, OPTIONAL
UECapabilityEnquiry-v1180-IEs ::= requestedFrequencyBands-r11 OPTIONAL,	SEQUENCE { SEQUENCE (SIZE (116)) OF FreqBand	lIndicator-r11
<pre>nonCriticalExtension }</pre>	UECapabilityEnquiry-v1310-IEs	OPTIONAL
<pre>UECapabilityEnquiry-v1310-IEs ::= requestReducedFormat-r13 requestSkipFallbackComb-r13 requestedMaxCCsDL-r13 requestedMaxCCsUL-r13 requestReducedIntNonContComb-r1 nonCriticalExtension }</pre>	SEQUENCE { ENUMERATED {true} ENUMERATED {true} INTEGER (232) INTEGER (232) 3 ENUMERATED {true} UECapabilityEnquiry-v1430-IES	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL
<pre>UECapabilityEnquiry-v1430-IEs ::= requestDiffFallbackCombList-r14 nonCriticalExtension }</pre>	SEQUENCE { BandCombinationList-r14 UECapabilityEnquiry-v1510-IEs	OPTIONAL, Need ON OPTIONAL
<pre>UECapabilityEnquiry-v1510-IEs ::= requestedFreqBandsNR-MRDC-r15 nonCriticalExtension }</pre>	SEQUENCE { OCTET STRING UECapabilityEnquiry-v1530-IEs	OPTIONAL, OPTIONAL
<pre>UECapabilityEnquiry-v1530-IEs ::= requestSTTI-SPT-Capability-r15 eutra-nr-only-r15 nonCriticalExtension }</pre>	SEQUENCE { ENUMERATED {true} ENUMERATED {true} UECapabilityEnquiry-v1550-IEs	OPTIONAL, OPTIONAL, OPTIONAL
<pre>UECapabilityEnquiry-v1550-IEs ::= requestedCapabilityNR-r15 nonCriticalExtension }</pre>	SEQUENCE { OCTET STRING UECapabilityEnquiry-v1560-IEs	OPTIONAL, OPTIONAL
UECapabilityEnquiry-v1560-IEs ::= requestedCapabilityCommon-r15	SEQUENCE { OCTET STRING	OPTIONAL,

nonCriticalExtension	SEQUENCE { }	OPTIONAL
}		
UE-CapabilityRequest ::=	SEQUENCE (SIZE (1maxRA	AT-Capabilities)) OF RAT-Type
ASN1STOP		

UECapabilityEnquiry field descriptions		
eutra-nr-only		
	e UE capabilities related to (NG)EN-DC only as specified in TS38.331 [82].	
requestDiffFallbackCombList		
	UE is requested to provide different capabilities for their fallback band	
	ilities supported for the CA band combinations in this list. The UE shall	
exclude fallback band combinations for white	ch their supported UE capabilities are the same as the CA band	
combination indicated in this list.		
requestReducedFormat		
Indicates that the UE is requested to provid		
	stead of the supportedBandCombination-r10. The E-UTRAN includes this	
field if requestSkipFallbackComb or reques	tDiffFallbackCombList is included in the message.	
requestSkipFallbackComb		
Indicates that the UE shall explicitly exclude	e fallback CA band combinations in capability signalling.	
ue-CapabilityRequest		
	ted to transfer the UE radio access capabilities i.e. E-UTRA, UTRA,	
	eparate RAT-Type value applies for some EUTRA-NR capabilities that are	
transferred by a separate UE capability con	tainer, used in case of MRDC.	
requestedFrequencyBands		
List of frequency bands for which the UE is	requested to provide supported CA band combinations and non CA bands	
requestedFreqBandsNR-MRDC		
	in TS 38.331 [82]. It concerns a list of NR and/ or E-UTRA frequency	
	vide its supported NR CA and/or MR-DC band combinations (i.e. within the	
UE capability containers for NR and MR-DC	C, as requested by E-UTRAN) and feature sets corresponding to the MR-	
	apability containers for LTE and NR, as requested by E-UTRAN).	
requestedCapabilityCommon		
	MR-DC related capability containers as defined by UE-	
CapabilityRequestFilterCommon IE in TS 3	8.331 [82].	
requestedCapabilityNR		
Interpreted as UE-CapabilityRequestFilterN	IR IE as specified in TS 38.331 [82], in which the field frequencyBandList is	
omitted.		
requestedMaxCCsDL, requestedMaxCCs		
Indicates the maximum number of CCs for	which the UE is requested to provide supported CA band combinations and	
non-CA bands.		
requestReducedIntNonContComb		
	e supported intra-band non-contiguous CA band combinations other than	
included in capability signalling as specified	l in TS 36.306 [5], clause 4.3.5.21.	
requestSTTI-SPT-Capability		
Indicates that the UE shall include all the sh	nort TTI and SPT capabilities in capability signalling.	

UECapabilityInformation

The UECapabilityInformation message is used to transfer of UE radio access capabilities requested by the E-UTRAN.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

UECapabilityInformation message

```
-- ASN1START
```

UECapabilityInformation ::= rrc-TransactionIdentifier criticalExtensions SEQUENCE {
 RRC-TransactionIdentifier,
 CHOICE {

```
c1
                                          CHOICE {
           ueCapabilityInformation-r8
                                              UECapabilityInformation-r8-IEs,
           spare7 NULL,
           spare6 NULL, spare5 NULL, spare4 NULL,
           spare3 NULL, spare2 NULL, spare1 NULL
       },
                                          SEQUENCE { }
       criticalExtensionsFuture
   }
}
UECapabilityInformation-r8-IEs ::= SEQUENCE {
   ue-CapabilityRAT-ContainerList UE-CapabilityRAT-ContainerList,
                                                                       OPTIONAL
   nonCriticalExtension
                                      UECapabilityInformation-v8a0-IEs
}
UECapabilityInformation-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension OCTET STRING
                                                                         OPTIONAL,
   nonCriticalExtension
                                      UECapabilityInformation-v1250-IEs OPTIONAL
}
UECapabilityInformation-v1250-IEs ::= SEQUENCE {
   ue-RadioPagingInfo-r12 UE-RadioPagingInfo-r12
                                                                         OPTIONAL,
   nonCriticalExtension
                                      SEQUENCE { }
                                                                         OPTIONAL
}
```

-- ASN1STOP

UECapabilityInformation field descriptions
ue-RadioPagingInfo
This field contains UE capability information used for paging.

UEInformationRequest

The UEInformationRequest is the command used by E-UTRAN to retrieve information from the UE.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

UEInformationRequest message

```
-- ASN1START
UEInformationRequest-r9 ::= SEQUENCE {
rrc-TransactionIdentifier RRC-TransactionIdentifier,
criticalExtensions CHOICE {
CHOICE {
            CHOICE {
spare3 NUT
                                                 UEInformationRequest-r9-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
                                             SEQUENCE { }
        criticalExtensionsFuture
    }
}
UEInformationRequest-r9-IEs ::=
                                   SEQUENCE {
    rach-ReportReg-r9
                                        BOOLEAN.
    rlf-ReportReq-r9
                                         BOOLEAN,
    nonCriticalExtension
                                         UEInformationRequest-v930-IEs
                                                                              OPTIONAL
}
UEInformationRequest-v930-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING
                                                                              OPTIONAL,
    nonCriticalExtension
                                         UEInformationRequest-v1020-IEs
                                                                              OPTIONAL
}
UEInformationRequest-v1020-IEs ::= SEQUENCE {
                          ENUMERATED {true}
UEInformationRegu
    logMeasReportReq-r10
                                                                              OPTIONAL,
                                                                                           -- Need ON
    nonCriticalExtension
                                        UEInformationRequest-v1130-IEs
                                                                              OPTIONAL
```

}

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<pre>> UEInformationRequest-v1130-IEs ::= SEQU connEstFailReportReq-r11 nonCriticalExtension }</pre>	JENCE { ENUMERATED {true} UEInformationRequest-v1250-IEs	OPTIONAL, OPTIONAL	Need ON
<pre>UEInformationRequest-v1250-IEs ::= SEQU mobilityHistoryReportReq-r12 nonCriticalExtension }</pre>	JENCE { ENUMERATED {true} UEInformationRequest-v1530-IEs	OPTIONAL, OPTIONAL	Need ON
<pre>UEInformationRequest-v1530-IEs ::= SEQU idleModeMeasurementReq-r15 flightPathInfoReq-r15 nonCriticalExtension }</pre>	JENCE { ENUMERATED {true} FlightPathInfoReportConfig-r15 SEQUENCE {}	OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need ON
ASN1STOP			

UEInformationRequest field descriptions

rach-ReportReq This field is used to indicate whether the UE shall report information about the random access procedure.

UEInformationResponse

The UEInformationResponse message is used by the UE to transfer the information requested by the E-UTRAN.

Signalling radio bearer: SRB1 or SRB2 (when logged measurement information is included)

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

UEInformationResponse message

```
-- ASN1START
UEInformationResponse-r9 ::= SEQUENCE {

rrc-TransactionIdentifier RRC-TransactionIdentifier,

criticalExtensions CHOICE {

c1 CHOICE {
                                      ueInformationResponse-r9 CHOICE {
spare3 NULL compared to the second sec
                         с1
                                                                                                                                                UEInformationResponse-r9-IEs,
                                      spare3 NULL, spare2 NULL, spare1 NULL
                          },
                         criticalExtensionsFuture
                                                                                                                                         SEQUENCE { }
             }
}
UEInformationResponse-r9-IEs ::=
                                                                                                                           SEQUENCE {
                       numberOfPreamblesSent-r9 NumberCf
contentionDetected-r9 BOOLEAN
          rach-Report-r9
                                                                                                                                                         NumberOfPreamblesSent-r11,
                                                                                                                                                       BOOLEAN
                                                                                                                                   OPTIONAL,
RLF-Report-r9 OPTIONAL,
UEInformationResponse-v930-IEs
                                                                                                                                                                                                                          OPTIONAL,
             rlf-Report-r9
                                                                                                                                                                                                                                                              OPTIONAL
           nonCriticalExtension
}
 -- Late non critical extensions
UEInformationResponse-v9e0-IEs ::= SEQUENCE {
                                                                               RLF-Report-v9e0
           rlf-Report-v9e0
                                                                                                                                                                                                                                   OPTIONAL,
                                                                                                                                 SEQUENCE { }
            nonCriticalExtension
                                                                                                                                                                                                                                       OPTIONAL
}
  -- Regular non critical extensions
UEInformationResponse-v930-IEs ::= SEQUENCE {
             lateNonCriticalExtension OCTET STRING (CONTAINING UEInformationResponse-v9e0-IEs)
             OPTIONAL,
            nonCriticalExtension
                                                                                                                               UEInformationResponse-v1020-IEs
                                                                                                                                                                                                                                                      OPTIONAL
}
```

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```
UEInformationResponse-v1020-IEs ::= SEQUENCE {
    logMeasReport-r10
                                                    LogMeasReport-r10
                                                                                                   OPTIONAL,
    nonCriticalExtension
                                                    UEInformationResponse-v1130-IEs
                                                                                                   OPTIONAL
}
UEInformationResponse-v1130-IEs ::= SEQUENCE {
    connEstFailReport-r11
                                                   ConnEstFailReport-r11
                                                                                                   OPTIONAL.
                                                    UEInformationResponse-v1250-IEs OPTIONAL
     nonCriticalExtension
}
UEInformationResponse-v1250-IEs ::= SEQUENCE {
    mobilityHistoryReport-r12MobilityHistoryReport-r12OPTIONAL,nonCriticalExtensionUEInformationResponse-v1530-IEsOPTIONAL
}
UEInformationResponse-v1530-IEs ::= SEQUENCE {

    measResultListIdle-r15
    OPTIONAL,

    flightPathInfoReport-r15
    FlightPathInfoReport-r15
    OPTIONAL,

    nonCriticalExtension
    SEQUENCE {}
    OPTIONAL

    nonCriticalExtension
                                                   SEQUENCE { }
                                                                                              OPTIONAL
}
    -Report-r9 ::= SEQUENCE {
measResultLastServCell-r9 SEQUENCE {
rsrpResult-r9 RSRP-Ra
rsrqResult-r9
RLF-Report-r9 ::=
                                                     RSRP-Range,
                                                                                                  OPTIONAL
                                                         RSRQ-Range
     },
    },
measResultNeighCells-r9 SEQUENCE {
    measResultListEUTRA-r9 MeasResultList2EUTRA-r9 OPTIONAL,
    measResultListUTRA-r9 MeasResultList2UTRA-r9 OPTIONAL,
    measResultListGERAN-r9 MeasResultListGERAN OPTIONAL,
    measResultSCDMA2000-r9 MeasResultList2CDMA2000-r9 OPTIONAL
     }
         OPTIONAL,
     ...,
[[ locationInfo-r10 LocationInfo-r10
failedPCellId-r10 CHOICE {
    cellGlobalId-r10 CellGlobalI
    pci-arfcn-r10 SEQUENCE {
        PhysCel
                                                                                                  OPTIONAL,
                                                        CellGlobalIdEUTRA,
                    physCellId-r10
                                                                   PhysCellId.
                     carrierFreq-r10
                                                                   ARFCN-ValueEUTRA
               }
          }
                                                                                                   OPTIONAL.
         }<br/>reestablishmentCellId-r10CellGlobalIdEUTRAtimeConnFailure-r10INTEGER (0..1023)connectionFailureType-r10ENUMERATED {rlf, hof}previousPCellId-r10CellGlobalIdEUTRA
                                                                                                   OPTIONAL,
                                                                                                    OPTIONAL,
                                                                                                   OPTIONAL,
                                                                                                    OPTIONAL
     11.
     ]],
[[ failedPCellId-v1090 SEQUENCE {
carrierFreq-v1090 ARFCN-V
                                                   ARFCN-ValueEUTRA-v9e0
          }
                                                                                                   OPTIONAL
     11,
     [[ basicFields-r11
                                                  SEQUENCE {
              c-RNTI-r11
                                                      C-RNTI,
               rlf-Cause-rll
                                                          ENUMERATED {
                                                               t310-Expiry, randomAccessProblem,
                                                               rlc-MaxNumRetx, t312-Expiry-r12},
               timeSinceFailure-r11
                                                       TimeSinceFailure-r11
          }
                                                                                                  OPTIONAL,
          }
previousUTRA-CellId-r11 SEQUENCE {
    carrierFreq-r11 ARFCN--
    physCellId-r11 CHOICE
                                                   ARFCN-ValueUTRA,
                                                          CHOICE {
                    fdd-r11
                                                               PhysCellIdUTRA-FDD,
                                                               PhysCellIdUTRA-TDD
                    tdd-r11
               },
               cellGlobalId-r11
                                                        CellGlobalIdUTRA
                                                                                                    OPTIONAL
          }
                                                                                                    OPTIONAL,
          selectedUTRA-CellId-r11
carrierFreq-r11
physCellId-r11
fdd-r11
                                                  SEQUENCE {
                                                    ARFCN-ValueUTRA,
                                                          CHOICE {
                    fdd-r11
                                                               PhysCellIdUTRA-FDD,
                                                               PhysCellIdUTRA-TDD
                     tdd-r11
               }
          }
                                                                                                    OPTIONAL
     ]],
               ledPCellId-v1250
tac-FailedPCell-r12
         failedPCellId-v1250
                                                    SEQUENCE {
     [[
                                                        TrackingAreaCode
                                                                                                    OPTIONAL.
          measResultLastServCell-v1250 RSRQ-Range-v1250
                                                                                                    OPTIONAL,
```

```
lastServCellRSRQ-Type-r12
                                      RSRQ-Type-r12
                                                                          OPTIONAL,
                                      MeasResultList2EUTRA-v1250
       measResultListEUTRA-v1250
                                                                          OPTIONAL
   11,
       drb-EstablishedWithQCI-1-r13 ENUMERATED {qci1}
                                                                          OPTTONAL
   ]]]
    ]],
   [[ measResultLastServCell-v1360 RSRP-Range-v1360
                                                                         OPTIONAL
   11.
       logMeasResultListBT-r15
                                      LogMeasResultListBT-r15
                                                                         OPTIONAL.
   [[
       logMeasResultListWLAN-r15
                                      LogMeasResultListWLAN-r15
                                                                         OPTIONAL
   ]]
}
RLF-Report-v9e0 ::=
                               SEOUENCE {
   measResultListEUTRA-v9e0
                                      MeasResultList2EUTRA-v9e0
}
MeasResultList2EUTRA-r9 ::=
                                      SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-r9
MeasResultList2EUTRA-v9e0 ::=
                                     SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-v9e0
                                     SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2EUTRA-v1250
MeasResultList2EUTRA-v1250 ::=
MeasResult2EUTRA-r9 ::=
                                 SEQUENCE {
   carrierFreg-r9
                                      ARFCN-ValueEUTRA,
   measResultList-r9
                                      MeasResultListEUTRA
}
                                  SEQUENCE {
MeasResult2EUTRA-v9e0 ::=
                                      ARFCN-ValueEUTRA-v9e0
   carrierFreq-v9e0
                                                               OPTIONAL
}
MeasResult2EUTRA-v1250 ::=
                                   SEQUENCE {
                                      RSRQ-Type-r12 OPTIONAL
   rsrq-Type-r12
}
MeasResultList2UTRA-r9 ::=
                                  SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2UTRA-r9
MeasResult2UTRA-r9 ::=
                                   SEOUENCE {
                                      ARFCN-ValueUTRA.
   carrierFreq-r9
   measResultList-r9
                                       MeasResultListUTRA
}
MeasResultList2CDMA2000-r9 ::=
                                  SEQUENCE (SIZE (1..maxFreq)) OF MeasResult2CDMA2000-r9
MeasResult2CDMA2000-r9 ::=
                                   SEQUENCE {
   carrierFreq-r9
                                      CarrierFreqCDMA2000,
                                      MeasResultsCDMA2000
   measResultList-r9
}
LogMeasReport-r10 ::=
                                 SEQUENCE {
   absoluteTimeStamp-r10
                                    AbsoluteTimeInfo-r10,
   traceReference-r10
                                      TraceReference-r10,
    traceRecordingSessionRef-r10
                                     OCTET STRING (SIZE (2)),
                                      OCTET STRING (SIZE (1)),
   tce-Id-r10
   logMeasInfoList-r10
                                      LogMeasInfoList-r10,
                                      ENUMERATED {true}
   logMeasAvailable-r10
                                                                     OPTIONAL.
   [[ logMeasAvailableBT-r15
                                    ENUMERATED {true}
                                                                      OPTIONAL,
       logMeasAvailableWLAN-r15
                                     ENUMERATED {true}
                                                                      OPTIONAL
   11
}
LogMeasInfoList-r10 ::= SEQUENCE (SIZE (1..maxLogMeasReport-r10)) OF LogMeasInfo-r10
                     SEQUENCE {
LogMeasInfo-r10 ::=
   locationInfo-r10
                                      LocationInfo-r10
                                                                      OPTIONAL,
   relativeTimeStamp-r10
                                       INTEGER (0..7200),
                                       CellGlobalIdEUTRA,
   servCellIdentity-r10
                                       SEQUENCE {
   measResultServCell-r10
       rsrpResult-r10
                                          RSRP-Range,
       rsrqResult-r10
                                          RSRQ-Range
   }.
                                      SEQUENCE {
   measResultNeighCells-r10
                                      MeasResultList2EUTRA-r9
       measResultListEUTRA-r10
                                                                  OPTIONAL,
OPTIONAL,
                                          MeasResultList2UTRA-r9
       measResultListUTRA-r10
       measResultListCDMA2000-r10
OPTIONAL
                                          MeasResultList2GERAN-r10
                                                                     OPTIONAL.
                                          MeasResultList2CDMA2000-r9 OPTIONAL
     OPTIONAL,
```

```
[[ measResultListEUTRA-v1090
                                                                             MeasResultList2EUTRA-v9e0 OPTIONAL
      1],
       [[ measResultListMBSFN-r12
                                                                             MeasResultListMBSFN-r12 OPTIONAL,
             measResultServCell-v1250
                                                                             RSRQ-Range-v1250
                                                                                                                              OPTIONAL,
              servCellRSRQ-Type-r12
                                                                             RSRQ-Type-r12
                                                                                                                              OPTIONAL.
             measResultListEUTRA-v1250
                                                                            MeasResultList2EUTRA-v1250 OPTIONAL
       ]],
       [[ inDeviceCoexDetected-r13
                                                                             ENUMERATED {true}
                                                                                                                              OPTIONAL
       ]],
       [[ measResultServCell-v1360
                                                                            RSRP-Range-v1360
                                                                                                                              OPTIONAL
       ]],
                                                                             LogMeasResultListBT-r15
       [[ logMeasResultListBT-r15
                                                                                                                              OPTIONAL,
              logMeasResultListWLAN-r15
                                                                            LogMeasResultListWLAN-r15 OPTIONAL
       11,
                                                                            ENUMERATED {true}
       [ anvCellSelectionDetected-r15
                                                                                                                              OPTIONAL
       11
}
MeasResultListMBSFN-r12 ::=
                                                             SEQUENCE (SIZE (1..maxMBSFN-Area)) OF MeasResultMBSFN-r12
                                                SEQUENCE {
MeasResultMBSFN-r12 ::=
                                                     SEQUENCE {
      mbsfn-Area-r12
                                                               MBSFN-AreaId-r12,
            mbsfn-AreaId-r12
                                                                     ARFCN-ValueEUTRA-r9
             carrierFreq-r12
      },
      rsrpResultMBSFN-r12
                                                         RSRP-Range,
      rsrqResultMBSFN-r12
                                                              MBSFN-RSRQ-Range-r12,
      IsiquesultionsprintingImage: 112Image: 112, image: 112, 
                                                                                                                      OPTIONAL.
                                                                                                                      OPTIONAL,
}
DataBLER-MCH-ResultList-r12 ::=
                                                             SEQUENCE (SIZE (1.. maxPMCH-PerMBSFN)) OF DataBLER-MCH-Result-
r12
DataBLER-MCH-Result-r12 ::=
                                                               SEQUENCE {
      mch-Index-r12
                                                                      INTEGER (1..maxPMCH-PerMBSFN),
       dataBLER-Result-r12
                                                                      BLER-Result-r12
}
BLER-Result-r12 ::=
                                                              SEOUENCE {
      bler-r12
                                                                  BLER-Range-r12,
       blocksReceived-r12
                                                                      SEQUENCE {
            n-r12
                                                                           BIT STRING (SIZE (3)),
             m-r12
                                                                             BIT STRING (SIZE (8))
       }
}
BLER-Range-r12 ::=
                                                                    INTEGER(0..31)
                                                                     SEQUENCE (SIZE (1..maxCellListGERAN)) OF MeasResultListGERAN
MeasResultList2GERAN-r10 ::=
ConnEstFailReport-r11 ::=
                                                                      SEQUENCE {
      failedCellId-r11
                                                                      CellGlobalIdEUTRA,
       locationInfo-r11
                                                                      LocationInfo-r10
                                                                                                                                     OPTIONAL.
       measResultFailedCell-r11
                                                                      SEQUENCE {
                                                                           RSRP-Range,
             rsrpResult-r11
             rsrqResult-r11
                                                                            RSRQ-Range
                                                                                                                                     OPTTONAL
       },
       measResultNeighCells-r11
                                                                     SEQUENCE {
                                                                     MeasResultList2EUTRA-r9
             measResultListEUTRA-r11
                                                                                                                                     OPTIONAL,
              measResultListUTRA-r11
                                                                            MeasResultList2UTRA-r9
                                                                                                                                    OPTIONAL,
              measResultListGERAN-r11
                                                                            MeasResultListGERAN
                                                                                                                                     OPTIONAL.
                                                                          MeasResultList2CDMA2000-r9
              measResultsCDMA2000-r11
                                                                                                                                     OPTIONAL
             OPTIONAL,
                                                                     NumberOfPreamblesSent-r11,
       numberOfPreamblesSent-r11
       contentionDetected-r11
                                                                     BOOLEAN,
       maxTxPowerReached-r11
                                                                     BOOLEAN.
       timeSinceFailure-r11
                                                                      TimeSinceFailure-r11,
                                                                   MeasResultList2EUTRA-v9e0
       measResultListEUTRA-v1130
                                                                                                                                     OPTIONAL,
       [[ measResultFailedCell-v1250
             measResultListEUTRA-v1250 MeasResult
                                                                  RSRQ-Range-v1250
                                                                                                                                     OPTIONAL,
                                                                                                                                     OPTIONAL,
                                                                     MeasResultList2EUTRA-v1250
                                                                                                                                     OPTIONAL
       11.
            measResultFailedCell-v1360
                                                                    RSRP-Range-v1360
                                                                                                                                     OPTIONAL
       ]]
       ]],
```

```
[[ logMeasResultListBT-r15LogMeasResultListBT-r15OPTIONALlogMeasResultListWLAN-r15LogMeasResultListWLAN-r15OPTIONAL
                                                                             OPTIONAL,
    ]]
}
NumberOfPreamblesSent-r11::=
                                       INTEGER (1..200)
TimeSinceFailure-r11 ::=
                                        INTEGER (0..172800)
MobilityHistoryReport-r12 ::= VisitedCellInfoList-r12
FlightPathInfoReport-r15 ::=
                                    SEQUENCE {
   flightPath-r15 SEQUENCE (SIZE (1..maxWayPoint-r15)) OF WayPointLocation-r15 OPTIONAL,
   nonCriticalExtension
                                       SEQUENCE { }
                                                                             OPTIONAL
}
WayPointLocation-r15 ::= SEQUENCE {
wayPointLocation-r15
   wayPointLocation-r15
                                                 LocationInfo-r10,
                                            AbsoluteTimeInfo-r10, OPTIONAL
   timeStamp-r15
}
-- ASN1STOP
```

	UEInformationResponse field descriptions
absoluteTimeStam	
	te time when the logged measurement configuration logging is provided, as indicated by E-
UTRAN within absol	
anyCellSelectionD	
	indicate the detection of any cell selection state, as defined in TS 36.304 [4]. The UE sets this fie
when performing the	logging of measurement results in RRC_IDLE and there is no suitable cell or no acceptable cell
bler	
Indicates the measu	red BLER value. The coding of BLER value is defined in TS 36.133 [16].
blocksReceived	
Indicates total numb	er of MCH blocks, which were received by the UE and used for the corresponding BLER
	e measurement period as defined in TS 36.133 [16].
carrierFreq	
	des carrierFreq-v9e0 and/ or carrierFreq-v1090, the UE shall set the corresponding entry of
	or carrierFreq-r10 respectively to maxEARFCN. For E-UTRA and UTRA frequencies, the UE sets
	ing to the band used when obtaining the concerned measurement results.
connectionFailure	
	ndicate whether the connection failure is due to radio link failure or handover failure.
contentionDetecte	-
	indicate that contention was detected for at least one of the transmitted preambles, see TS 36.32
[6].	
c-RNTI	
	ne C-RNTI used in the PCell upon detecting radio link failure or the C-RNTI used in the source
PCell upon handove	r failure.
dataBLER-MCH-Re	sultList
Includes a BLER res	sult per MCH on subframes using <i>dataMCS</i> , with the applicable MCH(s) listed in the same order
	vithin MBSFNAreaConfiguration.
drb-EstablishedWi	
	ndicate the radio link failure occurred while a bearer with QCI value equal to 1 was configured,
see TS 24.301 [35].	
failedCellId	
	indicate the cell in which connection establishment failed.
failedPCellId	
	indicate the PCell in which RLF is detected or the target PCell of the failed handover. The UE set
	ling to the band used for transmission/ reception when the failure occurred.
inDeviceCoexDete	
	rement logging is suspended due to IDC problem detection.
logMeasResultList	
	e Bluetooth measurement results.
logMeasResultList	WLAN
This field refers to the	e WLAN measurement results.
maxTxPowerReach	ied
	indicate whether or not the maximum power level was used for the last transmitted preamble, see
TS 36.321 [6].	
mch-Index	
	y referring to the entry as listed in pmch-InfoList within MBSFNAreaConfiguration.
measResultFailed	
	e last measurement results taken in the cell, where connection establishment failure happened.
	E Mode B, when CE mode B is not restricted by upper layers, <i>measResultFailedCell-v1360</i> is
	ured RSRP is less than -140 dBm.
measResultLastSe	
This field refers to th	e last measurement results taken in the PCell, where radio link failure or handover failure
happened. For BL U	Es or UEs in CE, when operating in CE Mode B, measResultLastServCell-v1360 is reported if th
	ess than -140 dBm.
measResultListEU	TRA
	ITRA-v9e0, measResultListEUTRA-v1090 or measResultListEUTRA-v1130 is included, the UE
	ne number of entries, and listed in the same order, as in <i>measResultListEUTRA-r9</i> ,
	RA-r10 and/ or measResultListEUTRA-r11 respectively.
measResultListEU	
measwesuncisteu	
	eport-r9 the UE shall include the same number of entries, and listed in the same order, as in
If included in RLF-R	
If included in <i>RLF-R</i> measResultListEUT	asInfo-r10 the UE shall include the same number of entries, and listed in the same order, as in
If included in <i>RLF-R</i> measResultListEUT If included in <i>LogM</i> e	
If included in <i>RLF-R</i> <i>measResultListEUT</i> If included in <i>LogMe</i> <i>measResultListEUT</i>	RA-r10;
If included in <i>RLF-R</i> <i>measResultListEUT</i> If included in <i>LogMe</i> <i>measResultListEUT</i>	
If included in <i>RLF-R</i> <i>measResultListEUT</i> If included in <i>LogMe</i> <i>measResultListEUT</i>	RA-r10; stFailReport-r11 the UE shall include the same number of entries, and listed in the same order, a
If included in <i>RLF-R</i> measResultListEUT If included in <i>LogMe</i> measResultListEUT If included in <i>ConnE</i>	RA-r10; stFailReport-r11 the UE shall include the same number of entries, and listed in the same order, a JTRA-r11;

UEInformationResponse field descri	ptions
measResultServCell	
This field refers to the log measurement results taken in the Serving cell. For mode B is not restricted by upper layers, <i>measResultServCell-v1360</i> is repo	
140 dBm.	
mobilityHistoryReport	
This field is used to indicate the time of stay in 16 most recently visited E-U	TRA cells or of stav out of E-UTRA.
numberOfPreamblesSent	,,,,
This field is used to indicate the number of RACH preambles that were tran PREAMBLE_TRANSMISSION_COUNTER in TS 36.321 [6].	smitted. Corresponds to parameter
previousPCellId	
This field is used to indicate the source PCell of the last handover (source F	PCell when the last RRC-Connection-
Reconfiguration message including mobilityControlInfowas received).	
previousUTRA-CellId	
This field is used to indicate the source UTRA cell of the last successful har	ndover to E-UTRAN, when RLF occurred a
the target PCell. The UE sets the ARFCN according to the band used for tra	
cell.	
reestablishmentCellId	
This field is used to indicate the cell in which the re-establishment attempt v	vas made after connection failure.
relativeTimeStamp	
Indicates the time of logging measurement results, measured relative to the	absoluteTimeStamp. Value in seconds.
rlf-Cause	
This field is used to indicate the cause of the last radio link failure that was	detected. In case of handover failure
information reporting (i.e., the connectionFailureType is set to 'hof'), the UE	
selectedUTRA-CellId	
This field is used to indicate the UTRA cell that the UE selects after RLF is	detected, while T311 is running. The UE
sets the ARFCN according to the band selected for transmission/ reception	
signallingBLER-Result	
Includes a BLER result of MBSFN subframes using signallingMCS.	
tac-FailedPCell	
This field is used to indicate the Tracking Area Code of the PCell in which F	RI F is detected
tce-Id	
Parameter Trace Collection Entity Id: See TS 32.422 [58].	
timeConnFailure	
This field is used to indicate the time elapsed since the last HO initialization	until connection failure Actual value -
field value * 100ms. The maximum value 1023 means 102.3s or longer.	
timeSinceFailure	
This field is used to indicate the time that elapsed since the connection (est	ablishment) failure Value in seconds. The
maximum value 172800 means 172800s or longer.	
timeStamp	
Includes time stamps for the waypoints that describe planned locations for t	he LIF
traceRecordingSessionRef	
Parameter Trace Recording Session Reference: See TS 32.422 [58].	
wayPointLocation	
Includes location coordinates for a UE for Aerial UE operation. The waypoir	ts describe planned locations for the LIF
The way put	

ULHandoverPreparationTransfer (CDMA2000)

The *ULHandoverPreparationTransfer* message is used for the uplink transfer of handover related CDMA2000 information when requested by the higher layers.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

ULHandoverPreparationTransfer message

-- ASN1START

ULHandoverPreparationTransfer ::= SEQUENCE { criticalExtensions CHOICE { cl CHOICE {

```
ulHandoverPreparationTransfer-r8
                                                   ULHandoverPreparationTransfer-r8-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                               SEQUENCE { }
    }
}
ULHandoverPreparationTransfer-r8-IEs ::= SEQUENCE {
                                      CDMA2000-Type,
    cdma2000-Type
    meid
                                       BIT STRING (SIZE (56))
                                                                              OPTIONAL,
    dedicatedInfo
                                       DedicatedInfoCDMA2000,
   nonCriticalExtension
                                      ULHandoverPreparationTransfer-v8a0-IEs OPTIONAL
}
ULHandoverPreparationTransfer-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension OCTET STRING
                                                                          OPTIONAL,
   nonCriticalExtension
                                       SEQUENCE { }
                                                                           OPTTONAL.
}
-- ASN1STOP
```

ULHandoverPreparationTransfer field descriptions

The 56 bit mobile identification number provided by the CDMA2000 Upper layers.

ULInformationTransfer

The ULInformationTransfer message is used for the uplink transfer of NAS or non-3GPP dedicated information.

Signalling radio bearer: SRB2 or SRB1(only if SRB2 not established yet). If SRB2 is suspended, the UE does not send this message until SRB2 is resumed

RLC-SAP: AM

meid

Logical channel: DCCH

Direction: UE to E-UTRAN

ULInformationTransfer message

```
-- ASN1START
```

```
SEOUENCE {
ULInformationTransfer ::=
                                  CHOICE {
   criticalExtensions
                                     CHOICE {
       c1
           ulInformationTransfer-r8
                                            ULInformationTransfer-r8-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
       },
       criticalExtensionsFuture
                                         SEQUENCE { }
   }
}
ULInformationTransfer-r8-IEs ::= SEQUENCE {
                         CHOICE {
   dedicatedInfoType
       dedicatedInfoNAS
                                         DedicatedInfoNAS,
       dedicatedInfoCDMA2000-1XRTT
                                         DedicatedInfoCDMA2000,
       dedicatedInfoCDMA2000-HRPD
                                        DedicatedInfoCDMA2000
   },
   nonCriticalExtension
                                    ULInformationTransfer-v8a0-IEs
                                                                       OPTIONAL
}
ULInformationTransfer-v8a0-IEs ::= SEQUENCE {
   lateNonCriticalExtension OCTET STRING
                                                                       OPTIONAL,
   nonCriticalExtension
                                     SEQUENCE { }
                                                                       OPTIONAL
}
-- ASN1STOP
```

ULInformationTransferMRDC

The *ULInformationTransferMRDC* message is used for the uplink transfer of MR DC information (i.e. for the case the SCG employs another RAT e.g. for transferring the NR RRC Measurement Report message).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

ULInformationTransferMRDC message

```
-- ASN1START
                                      SEQUENCE {
ULInformationTransferMRDC-r15 ::=
                                           CHOICE {
    criticalExtensions
                                               CHOICE {
        c1
             ulInformationTransferMRDC-r15
                                                        ULInformationTransferMRDC-r15-IEs,
             spare3 NULL, spare2 NULL, spare1 NULL
        },
                                               SEQUENCE { }
        criticalExtensionsFuture
    }
}
ULInformationTransferMRDC-r15-IEs ::= SEQUENCE {
    ul-DCCH-MessageNR-r15 OCTET STRING
lateNonCriticalExtension OCTET STRING
                                                                             OPTIONAL,
                                                                             OPTIONAL,
    nonCriticalExtension
                                      SEQUENCE { }
                                                                              OPTTONAL.
```

} -- ASN1STOP

ULInformationTransferMRDC field descriptions

ul-DCCH-MessageNR

Includes the *UL-DCCH-Message* as defined in TS 38.331 [82]. In this version of the specification, the field is only used to transfer the NR RRC MeasurementReport and the NR RRC FailureInformation messages.

WLANConnectionStatusReport

The *WLANConnectionStatusReport* message is used to inform the successful connection to WLAN or failure of the WLAN connection or connection attempt(s).

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

WLANConnectionStatusReport message

```
-- ASN1START
WLANConnectionStatusReport-r13 ::= SEQUENCE {
    criticalExtensions CHOICE {
        cl CHOICE {
            wlanConnectionStatusReport-r13 WLANConnectionStatusReport-r13-IEs,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture SEQUENCE {
    }
}
WLANConnectionStatusReport-r13-IEs ::= SEQUENCE {
```

```
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```

	wlan-Status-r13 lateNonCriticalExtension	WLAN-Status-r13, OCTET STRING	OPTIONAL,
	nonCriticalExtension	WLANConnectionStatusReport-v1430-IEs	OPTIONAL
	}	-	
V	WLANConnectionStatusReport-v1430-II	s ::= sequence {	
	wlan-Status-v1430	WLAN-Status-v1430,	
	nonCriticalExtension	SEQUENCE { }	OPTIONAL
	}		

```
-- ASN1STOP
```

WLANConnectionStatusReport field descriptions

wlan-Status

Indicates the connection status to WLAN and the cause of failures. If the *wlan-Status-v1430* is included, E-UTRAN ignores the *wlan-Status-r13*.

6.3 RRC information elements

6.3.1 System information blocks

SystemInformationBlockPos

The IE SystemInformationBlockPos contains positioning assistance data as defined in TS 36.355 [54].

SystemInformationBlockPos information element

```
-- ASN1START
SystemInformationBlockPos-r15 ::= SEQUENCE {
   assistanceDataSIB-Element-r15 OCTET STRING,
   lateNonCriticalExtension OCTET STRING
   ...
}
```

OPTIONAL,

-- ASN1STOP

SystemInformationBlockPos field descriptions

assistanceDataSIB-Element Parameter AssistanceDataSIBelement defined in TS 36.355 [54]. The first/leftmost bit of the first octet contains the most significant bit.

SystemInformationBlockType2

The IE SystemInformationBlockType2 contains radio resource configuration information that is common for all UEs.

NOTE: UE timers and constants related to functionality for which parameters are provided in another SIB are included in the corresponding SIB.

SystemInformationBlockType2 information element

ASN1START			
SystemInformationBlockType2 ::=	SEQUENCE {		
ac-BarringInfo	SEQUENCE {		
ac-BarringForEmergency	BOOLEAN,		
ac-BarringForMO-Signalling	AC-BarringConfig	OPTIONAL,	Need OP
ac-BarringForMO-Data	AC-BarringConfig	OPTIONAL	Need OP
}		OPTIONAL,	Need OP
radioResourceConfigCommon	RadioResourceConfigCommonSIB,		
ue-TimersAndConstants	UE-TimersAndConstants,		
freqInfo	SEQUENCE {		
ul-CarrierFreq	ARFCN-ValueEUTRA	OPTIONAL,	Need OP
ul-Bandwidth	ENUMERATED {n6, n15, n25, n50	, n75, n100}	

	},	additionalSpectrumEmission		AdditionalS	pectrumEmission		OPTIONAL,	1	Need	OP
	mbs tim	fn-SubframeConfigList eAlignmentTimerCommon		M-SubframeC AlignmentTi			OPTIONAL,	1	Need	OR
	 lat	eNonCriticalExtension C	OCTET SI	RING (CONTA	INING SystemInfo	rmati	ionBlockTyp	be2-v8	n0-IE	ls)
	[[OPTIONAL, ssac-BarringForMMTEL-Voice-r9 ssac-BarringForMMTEL-Video-r9		AC-BarringC AC-BarringC			OPTIONAL, OPTIONAL		Need Need	
		ac-BarringForCSFB-r10		AC-BarringC	onfig	OPTI	IONAL	Need	OP	
		ac-BarringSkipForMMTELVoice-r ac-BarringSkipForMMTELVideo-r ac-BarringSkipForSMS-r12 ac-BarringPerPLMN-List-r12	:12	ENUMERATED ENUMERATED ENUMERATED AC-BarringF	{true}	OPTI OPTI	IONAL, IONAL,	- Need - Need - Need - Need	OP OP	
]], [[voiceServiceCauseIndication-r	12	ENUMERATED	{true}	OPTI	IONAL	- Need	OP	
]], [[acdc-BarringForCommon-r13 acdc-BarringPerPLMN-List-r13			gForCommon-r13 gPerPLMN-List-r1	3	OPTIONAL, OPTIONAL		Need Need	
]], [[]],	udt-RestrictingForCommon-r13 udt-RestrictingPerPLMN-List-r cIoT-EPS-OptimisationInfo-r13 useFullResumeID-r13	3		tingPerPLMN-List timisationInfo-r		OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	1 1	Need Need Need Need	OR OP
		unicastFreqHoppingInd-r13		ENUMERATED	{true}		OPTIONAL	1	Need	OP
	[[mbsfn-SubframeConfigList-v143 videoServiceCauseIndication-r		MBSFN-Subfr ENUMERATED	ameConfigList-v1 {true}	430	OPTIONAL, OPTIONAL		Need Need	
]], [[]],	plmn-InfoList-r15		PLMN-InfoLi	st-r15		OPTIONAL	1	Need	OP
		cp-EDT-r15 up-EDT-r15 idleModeMeasurements-r15 reducedCP-LatencyEnabled-r15		ENUMERATED ENUMERATED ENUMERATED ENUMERATED	{true} {true}		OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	1 1	Need Need Need Need	OR OR
]], [[_		IERATED {tru		OPTI	IONAL	- Need	OR	
}]]									
Sys		nformationBlockType2-v8h0-IEs tiBandInfoList S		SEQUENCE {	marMultiDanda))		lditionalCr	ogtan	n Em i c	aion
}	OPT	IONAL, Need OR			<pre>maxMultiBands)) .ockType2-v9e0-IE</pre>		OPTIONAL	Jectru	111511115	STOIL
	tomT	nformationBlockType2-v9e0-IEs	··- 900	UIENCE J						
	ul- non	CarrierFreq-v9e0 CriticalExtension IONAL	ARFC	N-ValueEUTR	A-v9e0 OPT onBlockType2-v9i	IONAI 0-IEs		nd ul-	FreqM	lax
}										
	Foll		itical e	extensions f	rom REL-9 INING SystemInfo	rmati	ionBlockTyr	pe2-v1	0m0-1	Es)
}	dum	OPTIONAL, my SEQUENCE {} OPTIC	DNAL							
Sys		nformationBlockType2-v10m0-IEs qInfo-v1010	SEQU	JENCE {	litionalSpectrumE OPTIONAL,	missi	ion-v1010			
	ire ۱	additionalSpectrumEmission-v1								
1	} mul	tiBandInfoList-v1010 AdditionalSpectrumEmi	lssion-v	1010	(1maxMultiBand OPTIONA Ype2-v10n0-IEs		OFTIONAL			
} Sys	} mul non	tiBandInfoList-v1010 AdditionalSpectrumEmi CriticalExtension Syste	lssion-v emInform	1010 nationBlockT	(1maxMultiBand OPTIONA					
Sys	} mul non stemI Foll lat	tiBandInfoList-v1010 AdditionalSpectrumEmi CriticalExtension Syste nformationBlockType2-v10n0-IEs owing field is for non-critica eNonCriticalExtension OCTET	emInform s ::= SE al exten f STRING	1010 mationBlockT QUENCE { msions up-to	(1maxMultiBand OPTIONA Ype2-v10n0-IEs					

```
SystemInformationBlockType2-v13c0-IEs ::= SEQUENCE {
   uplinkPowerControlCommon-v13c0 UplinkPowerControlCommon-v1310
                                                                                     OPTIONAL, -- Need OR
-- Following field is for non-critical extensions from REL-13
    nonCriticalExtension
                                   SEQUENCE { }
                                                                                       OPTTONAL.
}
AC-BarringConfig ::=
                                         SEQUENCE {
    ac-BarringFactor
                                             ENUMERATED {
                                                  p00, p05, p10, p15, p20, p25, p30, p40,
                                                  p50, p60, p70, p75, p80, p85, p90, p95},
    ac-BarringTime
                                              ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512},
    ac-BarringForSpecialAC
                                              BIT STRING (SIZE(5))
}
MBSFN-SubframeConfigList ::=
                                        SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-
SubframeConfig
MBSFN-SubframeConfigList-v1430 ::= SEQUENCE (SIZE (1..maxMBSFN-Allocations)) OF MBSFN-
SubframeConfig-v1430
AC-BarringPerPLMN-List-rl2 ::= SEQUENCE (SIZE (1.. maxPLMN-rl1)) OF AC-BarringPerPLMN-rl2
    plmn-IdentityIndex-r12 ::= SEQUENCE {
ac-BarringInfo-r12
AC-BarringPerPLMN-r12 ::=
                                                 INTEGER (1..maxPLMN-r11),
                                                  SEQUENCE {
        ac-BarringForEmergency-r12
         ac-BarringForEmergency-r12 BOOLEAN,
ac-BarringForMO-Signalling-r12 AC-Barri
                                                 AC-BarringConfig OPTIONAL,
AC-BarringConfig OPTIONAL
                                                                                       -- Need OP
         ac-BarringForMO-Data-r12
                                                                                       -- Need OP
                                                                                      -- Need OP
                                                                        OPTIONAL,
    }OPTIONAL,ac-BarringSkipForMMTELVoice-r12ENUMERATED {true}OPTIONAL,ac-BarringSkipForMMTELVideo-r12ENUMERATED {true}OPTIONAL,ac-BarringSkipForSMS-r12ENUMERATED {true}OPTIONAL,ac-BarringForCSFB-r12AC-BarringConfigOPTIONAL,ssac-BarringForMMTEL-Voice-r12AC-BarringConfigOPTIONAL,ssac-BarringForMMTEL-Video-r12AC-BarringConfigOPTIONAL,
                                                                                       -- Need OP
                                                                                       -- Need OP
}
ACDC-BarringForCommon-r13 ::= SEQUENCE {
    acdc-HPLMNonly-r13
                                                 BOOLEAN,
    barringPerACDC-CategoryList-r13
                                                  BarringPerACDC-CategoryList-r13
}
ACDC-BarringPerPLMN-List-r13 ::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF ACDC-BarringPerPLMN-r13
ACDC-BarringPerPLMN-r13 ::= SEQUENCE {
    plmn-IdentityIndex-r13 INTEGER (1..maxPLMN-r11),
    acdc-OnlyForHPLMN-r13 BOOLEAN.
    acdc-OnlyForHPLMN-r13
                                             BOOLEAN,
    barringPerACDC-CategoryList-r13 BarringPerACDC-CategoryList-r13
}
BarringPerACDC-CategoryList-r13 ::= SEQUENCE (SIZE (1..maxACDC-Cat-r13)) OF BarringPerACDC-Category-
r13
BarringPerACDC-Category-r13 ::= SEQUENCE {
    acdc-Category-r13 INTEGER (1..maxACDC-Cat-r13),
acdc-BarringConfig-r13 SEQUENCE {
ac-BarringFactor-r13 ENUMERATED {
                                                 p00, p05, p10, p15, p20, p25, p30, p40,
                                                  p50, p60, p70, p75, p80, p85, p90, p95},
                                             ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512}
        ac-BarringTime-r13
    }
                                                  OPTIONAL
                                                                 -- Need OP
}
UDT-Restricting-r13 ::= SEQUENCE {
    udt-Restricting-r13
                                           ENUMERATED {true}
                                                                             OPTIONAL, --Need OR
    udt-Restricting-r13
udt-RestrictingTime-r13
                                            ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512}
OPTIONAL --Need OR
}
UDT-RestrictingPerPLMN-List-r13 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF UDT-RestrictingPerPLMN-r13
UDT-RestrictingPerPLMN-r13 ::= SEQUENCE {
    plmn-IdentityIndex-r13 INTEGER (1..maxPLMN-r11),
    udt-Restricting-r13
                                         UDT-Restricting-r13
                                                                        OPTIONAL --Need OR
}
CIOT-EPS-OptimisationInfo-r13 ::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF CIOT-OptimisationPLMN-r13
```

<pre>CIOT-OptimisationPLMN-r13::= SEQUENCE { up-CIoT-EPS-Optimisation-r13 cp-CIoT-EPS-Optimisation-r13 attachWithoutPDN-Connectivity-r13 }</pre>	ENUMERATED ENUMERATED ENUMERATED	{true} {true} {true}	,	Need OP Need OP Need OP
PLMN-InfoList-r15 ::= SEQU	JENCE (SIZE	(1maxPLMN-r11)) OF PLMN-Inf	lo-r15
<pre>PLMN-Info-r15 ::= SEQUENCE { upperLayerIndication-r15 }</pre>	ENUMERATED	{true}	OPTIONAL	Need OR
ASN1STOP				

	SystemInformationBlockType2 field descriptions
ac-BarringFactor	the LIE is lower than this value, appear is allowed. Otherwise the appear is barred
	the UE is lower than this value, access is allowed. Otherwise the access is barred.
	le range $[0,1)$: p00 = 0, p05 = 0.05, p10 = 0.10,, p95 = 0.95. Values other than p00
	corresponding ac-BarringForSpecialAC are set to 0.
ac-BarringForCSFB	
Access class barring for mobile	originating CS fallback.
ac-BarringForEmergency	
Access class barring for AC 10	
ac-BarringForMO-Data	
Access class barring for mobile	originating calls.
ac-BarringForMO-Signalling	
Access class barring for mobile	originating signalling
ac-BarringForSpecialAC	
	-15. The first/ leftmost bit is for AC 11, the second bit is for AC 12, and so on.
ac-BarringTime	
Mean access barring time value	e in seconds.
acdc-BarringConfig	
	DC category. If the field is absent, access to the cell is considered as not barred for the
ACDC category in accordance	with clause 5.3.3.13.
acdc-Category	
Indicates the ACDC category a	s defined in TS 24.105 [72].
acdc-OnlyForHPLMN	
	licable for UEs not in their HPLMN for the corresponding PLMN. TRUE indicates that
	is in their HPLMN for the corresponding PLMN. <i>FALSE</i> indicates that ACDC is
	HPLMN and UEs not in their HPLMN for the corresponding PLMN.
additionalSpectrumEmission	
	DIE AdditionalSpectrumEmission are defined in TS 36.101 [42], table 6.2.4-1, for UEs
	IS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs. NOTE 1.
attachWithoutPDN-Connectiv	
	at attach without PDN connectivity as specified in TS 24.301 [35] is supported for this
PLMN.	
barringPerACDC-CategoryLis	st
A list of barring information per	ACDC category according to the order defined in TS 22.011 [10]. The first entry in the
list corresponds to the highest /	ACDC category of which applications are the least restricted in access attempts at a
	corresponds to the ACDC category of which applications are restricted more than
	OC category in access attempts at a cell, and so on. The last entry in the list
	C category of which applications are the most restricted in access attempts at a cell.
cloT-EPS-OptimisationInfo	o category of which applications are the most restricted in access attempts at a cell.
	motore Value 1 indicates parameters for the DLMN listed 1st in the 1st n/mn
	meters. Value 1 indicates parameters for the PLMN listed 1st in the 1st <i>plmn</i> -
	alue 2 indicates parameters for the PLMN listed 2nd in the same <i>plmn-IdentityList</i> , or
	ent within the same <i>plmn-IdentityList</i> , then the value indicates paramters for PLMN
	nn-IdentityList within the same SIB1 and so on. NOTE 1.
cp-CloT-EPS-Optimisation	
This field indicates if the UE is a	allowed to establish the connection with Control plane CIoT EPS Optimisation, see TS
24.301 [35].	
cp-EDT	
	UE is allowed to initiate CP-EDT, see 5.3.3.1b.
dummy	
	cification. If received it shall be ignored by the UE.
idleModeMeasurements	
) can proceed indication of IDLE mode macaurements from UE
	3 can process indication of IDLE mode measurements from UE.
mbsfn-SubframeConfigList	
	reserved for MBSFN in downlink.
	S/Unicast mixed cell, EUTRAN includes mbsfn-SubframeConfigList-v1430. If a
	bes not use sub-frames #4 or #9 as MBSFN sub-frames, mbsfn-SubframeConfigList-
v1430 is still included and indic	ates all sub-frames as non-MBSFN sub-frames.
multiBandInfoList	
	ission i.e. one for each additional frequency band included in multiBandInfoList in
SystemInformationBlockType1	, listed in the same order. If E-UTRAN includes <i>multiBandInfoList-v10l0</i> it includes the
	sted in the same order, as in <i>multiBandInfoList</i> .
plmn-IdentityIndex	
	olmn-IdentityList fields included in SIB1. Value 1 indicates the PLMN listed 1st in the 1s
	B1. Value 2 indicates the PLMN listed 2nd in the same <i>plmn-IdentityList</i> , or when no
many DI MAL and muse a set with in	the same <i>plmn-IdentityList</i> , then the PLMN listed 1st in the subsequent <i>plmn-</i>
IdentityList within the same SIB	

SystemInformationBlockType2 field descriptions
plmn-InfoList
If E-UTRAN includes this field, it includes the same number of entries, and listed in the same order as PLMNs across
the plmn-IdentityList fields included in SIB1. I.e. the first entry corresponds to the first entry of the combined list that
results from concatenating the entries included in the second to the original plmn-IdentityList field.
reducedCP-LatencyEnabled
If present, reduced control plane latency is enabled. UEs supporting reduced CP latency transmit Msg3 according to
$k_1 \ge 5$ timing as specified in TS 36.213 [23] when transmitting RRCConnectionResumeRequest in Msg3.
mbms-ROM-ServiceIndication
This field indicates whether the UE is allowed to send MBMSInterestIndication message for the purpose of indicating
receive only mode MBMS service parameters.
ssac-BarringForMMTEL-Video
Service specific access class barring for MMTEL video originating calls.
ssac-BarringForMMTEL-Voice
Service specific access class barring for MMTEL voice originating calls.
udt-Restricting
Value TRUE indicates that the UE should indicate to the higher layers to restrict unattended data traffic TS 22.101 [77]
irrespective of the UE being in RRC_IDLE or RRC_CONNECTED. The UE shall not indicate to the higher layers if the
UE has one or more Access Classes, as stored on the USIM, with a value in the range 1115, which is valid for the
UE to use according to TS 22.011 [10] and TS 23.122 [11].
udt-RestrictingTime
If present and when the udt-Restricting changes from TRUE, the UE runs a timer for a period equal to rand * udt-
RestrictingTime, where rand is a random number drawn that is uniformly distributed in the range 0 ≤ rand < 1 value in
seconds. The timer stops if udt-Restricting changes to TRUE. Upon timer expiry, the UE indicates to the higher layers
that the restriction is alleviated.
unicastFreqHoppingInd
This field indicates if the UE is allowed to indicate support of frequency hopping for unicast MPDCCH/PDSCH/PUSCH
as described in TS 36.321 [6]. This field is included only in the BR version of SI message carrying
SystemInformationBlockType2.
ul-Bandwidth
Parameter: transmission bandwidth configuration, N _{RB} , in uplink, see TS 36.101 [42], table 5.6-1. Value n6
corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. If for FDD this parameter is absent, the uplink
bandwidth is equal to the downlink bandwidth. For TDD this parameter is absent and it is equal to the downlink
bandwidth. NOTE 1.
ul-CarrierFreq
For FDD: If absent, the (default) value determined from the default TX-RX frequency separation defined in TS 36.101
[42], table 5.7.3-1, applies.
For TDD: This parameter is absent and it is equal to the downlink frequency. NOTE 1.
up-CloT-EPS-Optimisation
This field indicates if the UE is allowed to resume the connection with User plane CIoT EPS Optimisation, see TS
24.301 [35].
up-EDT
This field indicates whether the UE is allowed to initiate UP-EDT, see 5.3.3.1b.
upperLayerIndication
Indication to be provided to upper layers.
useFullResumeID
This field indicates if the UE indicates full resume ID of 40 bits in RRCConnectionResumeRequest.
videoServiceCauseIndication
Indicates whether the UE is requested to use the establishment cause mo-VoiceCall for mobile originating MMTEL
video calls.
voiceServiceCauseIndication
Indicates whether UE is requested to use the establishment cause mo-VoiceCall for mobile originating MMTEL voice
calls.

Conditional presence	Explanation
ul-FreqMax	The field is mandatory present if <i>ul-CarrierFreq</i> (i.e. without suffix) is present and set to <i>maxEARFCN</i> . Otherwise the field is not present.

NOTE 1: E-UTRAN sets this field to the same value for all instances of SI message that are broadcasted within the same cell.

-- ASN1START

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SystemInformationBlockType3

The IE *SystemInformationBlockType3* contains cell re-selection information common for intra-frequency, interfrequency and/ or inter-RAT cell re-selection (i.e. applicable for more than one type of cell re-selection but not necessarily all) as well as intra-frequency cell re-selection information other than neighbouring cell related.

SystemInformationBlockType3 information element

```
SystemInformationBlockType3 ::=
                                  SEOUENCE {
                                      SEQUENCE {
   cellReselectionInfoCommon
       q-Hyst
                                          ENUMERATED {
                                              dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,
                                              dB12, dB14, dB16, dB18, dB20, dB22, dB24},
       speedStateReselectionPars
                                          SEQUENCE {
           mobilityStateParameters
                                             MobilityStateParameters,
           q-HystSF
                                          SEOUENCE {
               sf-Medium
                                            ENUMERATED {
                                                     dB-6, dB-4, dB-2, dB0},
               sf-High
                                              ENUMERATED
                                                     dB-6, dB-4, dB-2, dB0
           }
       }
                                                                     OPTIONAL
                                                                                    -- Need OP
   },
    cellReselectionServingFreqInfo
                                      SEQUENCE {
                                         ReselectionThreshold
       s-NonIntraSearch
                                                                     OPTIONAL,
                                                                                    -- Need OP
       threshServingLow
                                          ReselectionThreshold,
       cellReselectionPriority
                                          CellReselectionPriority
    intraFreqCellReselectionInfo SEQUENCE {
       q-RxLevMin
                                         Q-RxLevMin,
       p-Max
                                                                    OPTIONAL.
                                          P-Max
                                                                                    -- Need OP
                                                                                    -- Need OP
       s-IntraSearch
                                          ReselectionThreshold
                                                                    OPTIONAL,
                                         AllowedMeasBandwidth
       allowedMeasBandwidth
                                                                     OPTIONAL,
                                                                                    -- Need OP
       presenceAntennaPort1
                                          PresenceAntennaPort1,
       neighCellConfig
                                         NeighCellConfig,
       t-ReselectionEUTRA
                                          T-Reselection,
       t-ReselectionEUTRA-SF
                                          SpeedStateScaleFactors
                                                                   OPTIONAL
                                                                                    -- Need OP
   },
    . . . ,
   lateNonCriticalExtension
                                         OCTET STRING (CONTAINING SystemInformationBlockType3-
v10j0-IEs) OPTIONAL,
   [[ s-IntraSearch-v920
                                          SEQUENCE {
                                          ReselectionThreshold,
          s-IntraSearchP-r9
           s-IntraSearchQ-r9
                                             ReselectionThresholdQ-r9
       }
                                                                    OPTIONAL,
                                                                                    -- Need OP
       s-NonIntraSearch-v920
                                          SEQUENCE {
                                          ReselectionThreshold,
           s-NonIntraSearchP-r9
           s-NonIntraSearchQ-r9
                                             ReselectionThresholdQ-r9
                                                                    OPTIONAL,
       }
                                                                                    -- Need OP
                                                                     OPTIONAL,
       q-QualMin-r9
                                          Q-QualMin-r9
                                                                                    -- Need OP
                                          ReselectionThresholdQ-r9 OPTIONAL
                                                                                    -- Need OP
       threshServingLowQ-r9
    ]],
   [[ q-QualMinWB-r11
                                                                    OPTIONAL
                                                                                -- Cond WB-RSRO
                                          O-OualMin-r9
   ]],
[[ q-QualMinRSRQ-OnAllSymbols-r12
                                              Q-QualMin-r9
                                                                         OPTIONAL
Cond RSRQ
   ]],
   [[ cellReselectionServingFreqInfo-v1310 CellReselectionServingFreqInfo-v1310 OPTIONAL,
Need OP
       redistributionServingInfo-r13
                                              RedistributionServingInfo-r13 OPTIONAL, --Need OR
       cellSelectionInfoCE-r13
                                              CellSelectionInfoCE-r13
                                                                       OPTIONAL,
                                                                                        -- Need
OP
       t-ReselectionEUTRA-CE-r13
                                              T-ReselectionEUTRA-CE-r13 OPTIONAL
                                                                                        -- Need
OP
    ]],
                                            CellSelectionInfoCE1-r13 OPTIONAL
    [[ cellSelectionInfoCE1-r13
                                                                                    -- Need OP
   ]],
    [[ cellSelectionInfoCE1-v1360
                                        CellSelectionInfoCE1-v1360 OPTIONAL
                                                                                    -- Cond
QrxlevminCE1
   ]],
       cellReselectionInfoCommon-v1460 CellReselectionInfoCommon-v1460 OPTIONAL
   1 1
                                                                                    -- Need OR
   ]],
   [[ cellReselectionInfoHSDN-r15 CellReselectionInfoHSDN-r15 OPTIONAL,
                                                                                    -- Need OR
```

```
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```

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```
cellSelectionInfoCE-v1530 CellSelectionInfoCE-v1530 OPTIONAL, -- Need
OP
        crs-IntfMitigNeighCellsCE-r15 ENUMERATED {enabled} OPTIONAL -- Need OP
    11
}
   redistributionFactorCell-r13 ::= SEQUENCE {

redistributionFactorCell-r13 ENUMERATED{true}

t360-r13 ENUMERATED {min4}
RedistributionServingInfo-r13 ::=
                                                                                  OPTIONAL, --Need OP
                                             ENUMERATED {min4, min8, min16, min32, infinity,
                                               spare3, spare2, spare1 },
   redistrOnPagingOnly-r13 ENUMERATED {true} OPTIONAL
                                                                                      --Need OP
}
CellReselectionServingFreqInfo-v1310 ::= SEQUENCE {
cellReselectionSubPriority-r13 CellRe
                                                   CellReselectionSubPriority-r13
}
-- Late non critical extensions
SystemInformationBlockType3-v10j0-IEs ::= SEQUENCE {
    temInformationBlockType3-v10j0-1Es::= SEQUENCE {freqBandInfo-r10NS-PmaxList-r10OPTIONAL, -- Need ORmultiBandInfoList-v10j0MultiBandInfoList-v10j0OPTIONAL, -- Need ORnonCriticalExtensionSystemInformationBlockType3-v1010-IEs
   fregBandInfo-r10
    OPTIONAL
}
SystemInformationBlockType3-v1010-IEs ::= SEQUENCE {
    freqBandInfo-v1010NS-PmaxList-v1010OPTIONAL,multiBandInfoList-v1010MultiBandInfoList-v1010OPTIONAL,nonCriticalExtensionSEQUENCE {}OPTIONAL,
   freqBandInfo-v1010
                                                                                              -- Need OR
                                                                                             -- Need OR
   nonCriticalExtension
                                             SEQUENCE { }
}
CellReselectionInfoCommon-v1460 ::= SEQUENCE {
                                              ENUMERATED {dB6, dB9, dB12, dB15}
    s-SearchDeltaP-r14
}
CellReselectionInfoHSDN-r15 ::= SEQUENCE {
   cellEquivalentSize-r15 INTEGER(2..16)
}
-- ASN1STOP
```

	SystemInformationBlockType3 field descriptions
allowedMeasBandwid	
If absent, the value cor	responding to the downlink bandwidth indicated by the <i>dl-Bandwidth</i> included in
MasterInformationBloc	<i>k</i> applies.
cellEquivalentSize	
The number of cell cou	int used for mobility state estimation for this cell as specified in TS 36.304 [4].
cellSelectionInfoCE	
Parameters included ir	n coverage enhancement S criteria for BL UEs and UEs in CE, applicable for intra-frequency
	ent, coverage enhancement S criteria is not applicable.
cellSelectionInfoCE1	
Parameters included ir	n coverage enhancement S criteria for BL UEs and UEs in CE supporting CE Mode B,
	quency neighbour cells. E-UTRAN includes this IE only if cellSelectionInfoCE in SIB3 is preser
cellReselectionInfoC	
Cell re-selection inform	nation common for cells.
cellReselectionServi	
	or Cell re-selection to inter-frequency and inter-RAT cells.
crs-IntfMitigNeighCel	
	CE supporting <i>ce-CRS-IntfMitig</i> , this field indicates CRS interference mitigation, as specified ir
	3.6.1.2 and 3.6.1.3, is enabled in any of the intra-frequency neibhour cells, and the UE shall
	y neighbour cell RRM measurements in the center 6 PRBs.
freqBandInfo	י הפוצווטטעו טפון ולולוויו וווכמטעוכוווכוונט ווו נווב טכוונכו ט ד ולנטט.
	x and additionalSpectrumEmission values, as defined in TS 36.101 [42], table 6.2.4-1, for UEs
	Es and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, applicable for the intra-
	Es and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, applicable for the intra- E-UTRA cells if the UE selects the frequency band from <i>freqBandIndicator</i> in
	ckType1. If E-UTRAN includes freqBandInfo-v10I0 it includes the same number of entries, and
	r, as in freqBandInfo-r10.
intraFreqcellReselect	
	nation common for intra-frequency cells.
multiBandInfoList-v1	
	x and additionalSpectrumEmission values, as defined in TS 36.101 [42], table 6.2.4-1, for UEs
	Es and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, applicable for the intra-
	E-UTRA cells if the UE selects the frequency bands in <i>multiBandInfoList</i> (i.e. without suffix) of
	D. If E-UTRAN includes <i>multiBandInfoList-v10j0</i> , it includes the same number of entries, and
	r, as in <i>multiBandInfoList</i> (i.e. without suffix). If E-UTRAN includes <i>multiBandInfoList-v10l0</i> it
	nber of entries, and listed in the same order, as in <i>multiBandInfoList-v10j0</i> .
p-Max	
	e intra-frequency neighbouring E-UTRA cells. If absent the UE applies the maximum power
	lity as specified in TS 36.101 [42], clause 6.2.2.
redistrOnPagingOnly	
	nd the UE is redistribution capable, the UE shall only wait for the paging message to trigger E-
	y redistribution procedure as specified in clause 5.2.4.10 of TS 36.304 [4].
q-Hyst	
Parameter Q _{hyst} in TS :	36.304 [4], Value in dB. Value dB1 corresponds to 1 dB, dB2 corresponds to 2 dB and so on.
q-HystSF	
Parameter "Speed dep	pendent ScalingFactor for Q_{hyst} " in TS 36.304 [4]. The sf-Medium and sf-High concern the
additional hysteresis to	be applied, in Medium and High Mobility state respectively, to Q_{hyst} as defined in TS 36.304
[4]. In dB. Value dB-6 (corresponds to -6dB, dB-4 corresponds to -4dB and so on.
g-QualMin	· · ·
	TS 36.304 [4], applicable for intra-frequency neighbour cells. If the field is not present, the UE
	lue of negative infinity for Q _{qualmin} . NOTE 1.
q-QualMinRSRQ-OnA	
	nd supported by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ
	FDM symbols in accordance with TS 36.214 [48]. NOTE 1.
q-QualMinWB	
	nd supported by the UE, the UE shall, when performing RSRQ measurements, use a wider
	ce with TS 36.133 [16]. NOTE 1.
q-RxLevMin Parameter "O" in	TS 26 204 [4] applicable for intra frequency paidbhour calls
	TS 36.304 [4], applicable for intra-frequency neighbour cells.
redistributionFactor(
	Cell is present, redistributionFactorServing is only applicable for the serving cell otherwise it is
applicable for serving f	
redistributionFactorS	
	onFactorServing in TS 36.304 [4].
s-IntraSearch	
	in TS 36.304 [4]. If the field s-IntraSearchP is present, the UE applies the value of s-
	Otherwise if neither s-IntraSearch nor s-IntraSearchP is present, the UE applies the (default)

SystemInformationBlockType3 field descriptions	
s-IntraSearchP	
Parameter "SIntraSearchP" in TS 36.304 [4]. See descriptions under s-IntraSearch.	
s-IntraSearchQ	
Parameter "SIntraSearchq" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of 0 dB for	
SIntraSearchQ.	
s-NonIntraSearch	
Parameter "SnonIntraSearchP" in TS 36.304 [4]. If the field s-NonIntraSearchP is present, the UE applies the value of s-	
NonIntraSearchP instead. Otherwise if neither s-NonIntraSearch nor s-NonIntraSearchP is present, the UE applies	the
(default) value of infinity for SnonIntraSearchP.	
s-NonIntraSearchP	
Parameter "SnonIntraSearchP" in TS 36.304 [4]. See descriptions under s-NonIntraSearch.	
s-NonIntraSearchQ	
Parameter "SnonIntraSearcho" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of 0 dB for	
SnonIntraSearchQ.	
s-SearchDeltaP	
Parameter "SsearchDeltaP" in TS 36.304 [4]. This parameter is only applicable for UEs supporting relaxed monitoring a	S
specified in TS 36.306 [5]. Value dB6 corresponds to 6 dB, dB9 corresponds to 9 dB and so on.	
speedStateReselectionPars	
Speed dependent reselection parameters, see TS 36.304 [4]. If this field is absent, i.e., mobilityStateParameters is a	also
not present, UE behaviour is specified in TS 36.304 [4].	
t360	
Parameter "T360" in TS 36.304 [4]. Value min4 corresponds to 4 minutes, value min8 corresponds to 8 minutes, ar	d
so on.	
threshServingLow	
Parameter "Thresh _{Serving, Low} p" in TS 36.304 [4].	
threshServingLowQ	
Parameter "Thresh _{Serving, LowQ} " in TS 36.304 [4].	
t-ReselectionEUTRA	
Parameter "TreselectionEUTRA" in TS 36.304 [4].	
t-ReselectionEUTRA-SF	
Parameter "Speed dependent ScalingFactor for TreselectionEUTRA" in TS 36.304 [4]. If the field is not present, the U	E
behaviour is specified in TS 36.304 [4].	

NOTE 1: The value the UE applies for parameter "Q_{qualmin}" in TS 36.304 [4] depends on the *q*-QualMin fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

q-QualMinRSRQ-OnAllSymbols	q-QualMinWB	Value of parameter "Q _{qualmin} " in TS 36.304 [4]
Included	Included	q-QualMinRSRQ-OnAllSymbols – (q-QualMin – q-
		QualMinWB)
Included	Not included	q-QualMinRSRQ-OnAllSymbols
Not included	Included	q-QualMinWB
Not included	Not included	q-QualMin

Conditional presence	Explanation
QrxlevminCE1	The field is optionally present, Need OR, if <i>q-RxLevMinCE1-r13</i> is set below -140 dBm.
	Otherwise the field is not present.
RSRQ	The field is optionally present, Need OR, if <i>threshServingLowQ</i> is present in SIB3;
	otherwise it is not present.
WB-RSRQ	The field is optionally present, need OP if the measurement bandwidth indicated by
	allowedMeasBandwidth is 50 resource blocks or larger; otherwise it is not present.

SystemInformationBlockType4

The IE *SystemInformationBlockType4* contains neighbouring cell related information relevant only for intra-frequency cell re-selection. The IE includes cells with specific re-selection parameters as well as blacklisted cells.

SystemInformationBlockType4 information element

-- ASN1START

```
SystemInformationBlockType4 ::= SEQUENCE {
                                       IntraFreqNeighCellList
    intraFreqNeighCellList
                                                                   OPTIONAL, -- Need OR
    intraFregBlackCellList
                                       IntraFreqBlackCellList
                                                                      OPTIONAL, -- Need OR
                                       PhysCellIdRange
    csg-PhysCellIdRange
                                                                   OPTIONAL, -- Cond CSG
    lateNonCriticalExtension
                                           OCTET STRING
                                                                       OPTIONAL,
       intraFreqNeighHSDN-CellList-r15
                                           IntraFreqNeighHSDN-CellList-r15 OPTIONAL
                                                                                       -- Need OR
    ΓΓ
    ]]
}
IntraFreqNeighCellList ::=
                               SEQUENCE (SIZE (1..maxCellIntra)) OF IntraFreqNeighCellInfo
IntraFreqNeighHSDN-CellList-r15 ::= SEQUENCE (SIZE (1..maxCellIntra)) OF PhysCellIdRange
IntraFreqNeighCellInfo ::=
                               SEQUENCE {
   physCellId
                                           PhysCellId,
    q-OffsetCell
                                           O-OffsetRange,
    . . .
}
                               SEQUENCE (SIZE (1..maxCellBlack)) OF PhysCellIdRange
IntraFreqBlackCellList ::=
-- ASN1STOP
```

SystemInformationBlockType4 field descriptions

 csg-PhysCellIdRange

 Set of physical cell identities reserved for CSG cells on the frequency on which this field was received. The received

 csg-PhysCellIdRange applies if less than 24 hours has elapsed since it was received and the UE is camped on a cell

 of the same primary PLMN where this field was received. The 3 hour validity restriction (clause 5.2.1.3) does not apply

 to this field. The UE shall not apply any stored csg-PhysCellIdRange when it is in any cell selection state defined in TS 36.304 [4].

 intraFreqBlackCellList

 List of blacklisted intra-frequency neighbouring cells.

 intraFreqNeighbCellList

 List of intra-frequency neighbouring cells with specific cell re-selection parameters.

 intraFreqNeighHSDN-CellList

 List of intra-frequency neighbouring HSDN cells as specified in TS 36.304 [4].

 q-OffsetCell

 Parameter "Qoffsets,n" in TS 36.304 [4].

Conditional presence	Explanation
CSG	This field is optional, need OP, for non-CSG cells, and mandatory for CSG cells.

SystemInformationBlockType5

-- ASN1START

The IE *SystemInformationBlockType5* contains information relevant only for inter-frequency cell re-selection i.e. information about other E-UTRA frequencies and inter-frequency neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

SystemInformationBlockType5 information element

-								
Syst	emIr	nformationBlockType5 ::= SEQU	JENCE	5 {				
	inte	erFreqCarrierFreqList	Inte	erFreqCarrierFre	qList,			
	• • • •							
		eNonCriticalExtension		OCTET STRING	(CONTAINING	SystemIr	nformationBl	ockType5-
v8h0)-IEs	s) OPTIONAL,						
	[[interFreqCarrierFreqList-v1250	Inte	erFreqCarrierFre	qList-v1250	OPTI	IONAL,	Need OR
		interFreqCarrierFreqListExt-r12	Inte	erFreqCarrierFre	qListExt-r12	OPTIONAL	L Need	OR
]],							
	[[interFreqCarrierFreqListExt-v128	30	InterFreqCarrie	rFreqListExt-	v1280	OPTIONAL	Need
OR								
]],							
	[[interFreqCarrierFreqList-v1310		InterFreqCarrie	rFreqList-v13	10	OPTIONAL,	Need
OR								
		interFreqCarrierFreqListExt-v131	0	InterFreqCarrie	rFreqListExt-	v1310	OPTIONAL	Need
OR								
]],							

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```
[[ interFreqCarrierFreqList-v1350
                                           InterFreqCarrierFreqList-v1350 OPTIONAL,
                                                                                      -- Need OR
    interFreqCarrierFreqListExt-v1350 InterFreqCarrierFreqListExt-v1350 OPTIONAL
                                                                                       -- Need OR
    11,
    ]]]
       interFreqCarrierFreqListExt-v1360
                                           InterFreqCarrierFreqListExt-v1360
                                                                              OPTIONAL
                                                                                           -- Need
OR
    ]],
       scptm-FregOffset-r14
                                           INTEGER (1..8)
                                                                           OPTIONAL
                                                                                    -- Need OP
    11
    11
    [[ interFreqCarrierFreqList-v1530
                                           InterFreqCarrierFreqList-v1530
                                                                              OPTIONAL,
                                                                                           -- Need
OR
        interFreqCarrierFreqListExt-v1530 InterFreqCarrierFreqListExt-v1530 OPTIONAL,
                                                                                           -- Need
OR
       measIdleConfigSIB-r15
                                           MeasIdleConfigSIB-r15
                                                                         OPTIONAL -- Need OR
    ]]
}
-- Late non critical extensions
SystemInformationBlockType5-v8h0-IEs ::=
                                           SEQUENCE {
    interFreqCarrierFreqList-v8h0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v8h0
       OPTIONAL,
                  -- Need OP
                                   SystemInformationBlockType5-v9e0-IEs
    nonCriticalExtension
    OPTIONAL
}
SystemInformationBlockType5-v9e0-IEs ::=
                                          SEQUENCE {
    interFreqCarrierFreqList-v9e0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v9e0
           OPTIONAL,
                       -- Need OR
    nonCriticalExtension
                                   SystemInformationBlockType5-v10j0-IEs OPTIONAL
}
SystemInformationBlockType5-v10j0-IEs ::=
                                          SEQUENCE {
    interFreqCarrierFreqList-v10j0 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v10j0
               OPTIONAL, -- Need OR
    nonCriticalExtension
                                   SystemInformationBlockType5-v1010-IEs
                                                                               OPTIONAL
}
SystemInformationBlockType5-v1010-IEs ::=
                                          SEQUENCE {
   interFreqCarrierFreqList-v1010 SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-v1010
               OPTIONAL, -- Need OR
    nonCriticalExtension
                                   SystemInformationBlockType5-v13a0-IEs
                                                                                  OPTTONAL.
}
SystemInformationBlockType5-v13a0-IEs ::= SEQUENCE {
    -- Late non critical extensions from REL-10 upto REL-12
    lateNonCriticalExtension
                                 OCTET STRING
                                                                   OPTIONAL,
                                                                               -- Need OR
    interFreqCarrierFreqList-v13a0 InterFreqCarrierFreqList-v13a0 OPTIONAL,
                                                                               -- Need OR
    -- Late non critical extensions from REL-13
    nonCriticalExtension
                                   SEQUENCE { }
                                                                   OPTIONAL
InterFreqCarrierFreqList ::=
                                   SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo
InterFreqCarrierFreqList-v1250 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1250
InterFreqCarrierFreqList-v1310 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1310
InterFreqCarrierFreqList-v1350 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1350
InterFreqCarrierFreqList-v13a0 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1360
InterFreqCarrierFreqList-v1530 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-v1530
InterFreqCarrierFreqListExt-r12 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-r12
InterFreqCarrierFreqListExt-v1280 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-
        v10j0
InterFreqCarrierFreqListExt-v1310 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-
        v1310
InterFreqCarrierFreqListExt-v1350 ::= SEQUENCE (SIZE (1.. maxFreq)) OF InterFreqCarrierFreqInfo-
        v1350
InterFreqCarrierFreqListExt-v1360 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-
v1360
InterFreqCarrierFreqListExt-v1530 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-
        v1530
```

dl-CarrierFreq	UENCE { ARFCN-ValueEUTRA,	
q-RxLevMin p-Max	Q-RxLevMin, P-Max	OPTIONAL, Need OP
t-ReselectionEUTRA	T-Reselection,	
t-ReselectionEUTRA-SF threshX-High	SpeedStateScaleFactors ReselectionThreshold,	OPTIONAL, Need OP
threshX-Low	ReselectionThreshold,	
allowedMeasBandwidth presenceAntennaPort1	AllowedMeasBandwidth, PresenceAntennaPort1,	
cellReselectionPriority	CellReselectionPriority	OPTIONAL, Need OP
neighCellConfig g-OffsetFreg	NeighCellConfig, Q-OffsetRange	DEFAULT dB0,
interFreqNeighCellList	InterFreqNeighCellList	OPTIONAL, Need OR
interFreqBlackCellList	InterFreqBlackCellList	OPTIONAL, Need OR
, [[g-QualMin-r9	Q-QualMin-r9	OPTIONAL, Need OP
threshX-Q-r9	SEQUENCE {	
threshX-HighQ-r9 threshX-LowQ-r9	ReselectionThresholdQ-r9, ReselectionThresholdO-r9	
}		OPTIONAL Cond RSR(
]], [[g-QualMinWB-r11	O-OualMin-r9	OPTIONAL Cond WB-RSRQ
,]]	~ ~ ~	· · · · · · · · · · · · · · · · · · ·
}		
<pre>InterFreqCarrierFreqInfo-v8h0 ::=</pre>	SEQUENCE {	
<pre>multiBandInfoList }</pre>	MultiBandInfoList	OPTIONAL Need OR
	<i>,</i>	
<pre>InterFreqCarrierFreqInfo-v9e0 ::= dl-CarrierFreq-v9e0</pre>	SEQUENCE { ARFCN-ValueEUTRA-v9e0 OPTIC	NAL, Cond dl-FreqMax
multiBandInfoList-v9e0	MultiBandInfoList-v9e0 OPTIC	· · · · · · · · · · · · · · · · · · ·
}		
<pre>InterFreqCarrierFreqInfo-v10j0 ::=</pre>	•	
freqBandInfo-r10 multiBandInfoList-v10j0		OPTIONAL, Need OR OPTIONAL Need OR
}		
InterFreqCarrierFreqInfo-v1010 ::=	SEQUENCE {	
freqBandInfo-v1010	NS-PmaxList-v1010 C	PTIONAL, Need OR
<pre>multiBandInfoList-v1010 }</pre>	MultiBandInfoList-v1010 C	OPTIONAL Need OR
	<u>,</u>	
<pre>InterFreqCarrierFreqInfo-v1250 ::= reducedMeasPerformance-r12</pre>	SEQUENCE { ENUMERATED {true} OPTIONAL,	Need OP
q-QualMinRSRQ-OnAllSymbols-r12	, , , , , , , , , , , , , , , , , , , ,	PTIONAL Cond RSRQ2
}		
<pre>InterFreqCarrierFreqInfo-r12 ::=</pre>	SEQUENCE {	
dl-CarrierFreq-r12 q-RxLevMin-r12	ARFCN-ValueEUTRA-r9, Q-RxLevMin,	
p-Max-r12	P-Max	OPTIONAL, Need OP
t-ReselectionEUTRA-r12 t-ReselectionEUTRA-SF-r12	T-Reselection, SpeedStateScaleFactors	OPTIONAL, Need OP
threshX-High-r12	ReselectionThreshold,	OPTIONAL, Need OP
threshX-Low-r12	ReselectionThreshold,	
allowedMeasBandwidth-r12 presenceAntennaPort1-r12	AllowedMeasBandwidth, PresenceAntennaPort1,	
cellReselectionPriority-r12	CellReselectionPriority	OPTIONAL, Need OP
neighCellConfig-r12 q-OffsetFreq-r12	NeighCellConfig, O-OffsetRange	DEFAULT dB0,
interFreqNeighCellList-r12	InterFreqNeighCellList	OPTIONAL, Need OR
interFreqBlackCellList-r12 q-QualMin-r12	InterFreqBlackCellList Q-QualMin-r9	OPTIONAL, Need OR OPTIONAL, Need OP
threshX-Q-r12	SEQUENCE {	
threshX-HighQ-r12	ReselectionThresholdQ-r9,	
threehy_Low0_v10		
threshX-LowQ-r12 }	ReselectionThresholdQ-r9	OPTIONAL, Cond RSRQ
} q-QualMinWB-r12	Q-QualMin-r9	OPTIONAL, Cond WB-RSRQ
}		
} q-QualMinWB-r12 multiBandInfoList-r12	Q-QualMin-r9 MultiBandInfoList-r11	OPTIONAL, Cond WB-RSRQ OPTIONAL, Need OR
} q-QualMinWB-r12 multiBandInfoList-r12 reducedMeasPerformance-r12	Q-QualMin-r9 MultiBandInfoList-r11 ENUMERATED {true}	OPTIONAL, Cond WB-RSRQ OPTIONAL, Need OR OPTIONAL, Need OP

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```
InterFreqCarrierFreqInfo-v1310 ::= SEQUENCE {
                                                                                   CellReselectionSubPriority-r13
         cellReselectionSubPriority-r13
                                                                                                                                                                      OPTIONAL,
                                                                                                                                                                                                               -- Need
OP
        redistributionInterFreqInfo-r13 RedistributionInterFreqInfo-r13 cellSelectionInfoCE-r13 CellSelectionEITERA-CE-r13 CellSelectionE
                                                                                                                                                                        OPTIONAL, --Need OP
                                                                                                                                                      OPTIONAL, -- Need OP
OPTIONAL -- Need OP
                                                                                                                                                                                            -- Need OP
         t-ReselectionEUTRA-CE-r13
                                                                                       T-ReselectionEUTRA-CE-r13
}
InterFreqCarrierFreqInfo-v1350 ::= SEQUENCE {
         cellSelectionInfoCE1-r13
                                                                                        CellSelectionInfoCE1-r13
                                                                                                                                                                        OPTIONAL
                                                                                                                                                                                                    -- Need OP
}
InterFreqCarrierFreqInfo-v1360 ::= SEQUENCE {
       cellSelectionInfoCE1-v1360
                                                                             CellSelectionInfoCE1-v1360 OPTIONAL -- Cond QrxlevminCE1
}
InterFreqCarrierFreqInfo-v1530 ::= SEQUENCE {
        hsdn-Indication-r15 BOOLEAN,
interFreqNeighHSDN-CellList-r15 InterFreqNeighHSDN-CellList-r15 OPTIONAL, -- Need OR
        hsdn-Indication-r15
        cellSelectionInfoCE-v1530
                                                                                        CellSelectionInfoCE-v1530
                                                                                                                                                                        OPTIONAL
                                                                                                                                                                                                    -- Need OP
}
InterFreqNeighCellList ::= SEQUENCE (SIZE (1..maxCellInter)) OF InterFreqNeighCellInfo
InterFreqNeighHSDN-CellList-r15 ::= SEQUENCE (SIZE (1..maxCellInter)) OF PhysCellIdRange
InterFreqNeighCellInfo ::=
                                                                                SEQUENCE {
       physCellId
                                                                                        PhysCellId,
         q-OffsetCell
                                                                                         Q-OffsetRange
}
InterFreqBlackCellList ::=
                                                                             SEQUENCE (SIZE (1..maxCellBlack)) OF PhysCellIdRange
RedistributionInterFreqInfo-r13 ::= SEQUENCE {
redistributionFactorFreq-r13 Redist
redistributionNeighCellList-r13 Redist;
                                                                                               RedistributionFactor-r13 OPTIONAL, --Need OP
                                                                                                  RedistributionNeighCellList-r13 OPTIONAL --Need
OP
}
RedistributionNeighCellList-r13 ::= SEQUENCE (SIZE (1..maxCellInter)) OF RedistributionNeighCell-r13
                                                                             SEQUENCE {
RedistributionNeighCell-r13 ::=
       physCellId-r13
                                                                                                                    PhysCellId,
         redistributionFactorCell-r13
                                                                                                                    RedistributionFactor-r13
}
RedistributionFactor-r13 ::= INTEGER(1..10)
-- ASN1STOP
```

	SystemInformationBlockType5 field descriptions
cellSelectionInfoCE	
	e enhancement S criteria for BL UEs and UEs in CE, applicable for inter-frequency
neighbour cells. If absent, cover	age enhancement S criteria is not applicable.
cellSelectionInfoCE1	
Parameters included in coverage	e enhancement S criteria for BL UEs and UEs in CE supporting CE Mode B. E-
	an entry of InterFreqCarrierFreqList-v1350 or InterFreqCarrierFreqListExt-v1350 if
	the corresponding entry of InterFreqCarrierFreqList-v1310 or
InterFreqCarrierFreqListExt-v13	
freqBandInfo	
	ditionalSpectrumEmission values, as defined in TS 36.101 [42], table 6.2.4-1, for UEs
	S 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, for the frequency band
	or which cell reselection parameters are common. If E-UTRAN includes freqBandInfo-
	per of entries, and listed in the same order, as in <i>freqBandInfo-r10</i> .
hsdn-Indication	
Indicates whether there are dep	loyed HSDN cells or not on the the DL carrier frequency indicated by <i>dl-CarrierFreq</i> -
r12.	
interFreqBlackCellList	
List of blacklisted inter-frequency	v pejabbouring cells
interFreqCarrierFreqList	
	noing E LITRAN doop not configure more than one or the for the same where the
	ncies. E-UTRAN does not configure more than one entry for the same physical
	RFCN used to indicate this. If E-UTRAN includes interFreqCarrierFreqList-v8h0,
	nterFreqCarrierFreqList-v1250, InterFreqCarrierFreqList-v1310,
	InterFreqCarrierFreqList-v13a0 and/or InterFreqCarrierFreqList-v1530, it includes the
	ted in the same order, as in <i>interFreqCarrierFreqList</i> (i.e. without suffix). See Annex D
or more descriptions.	
interFreqCarrierFreqListExt	
	nter-frequencies, i.e. extending the size of the inter-frequency carrier list using the
	1.2. E-UTRAN does not configure more than one entry for the same physical
	RFCN used to indicate this. EUTRAN may include interFreqCarrierFreqListExt even it
	nout suffix) does not include maxFreq entries. If E-UTRAN includes
	10, InterFreqCarrierFreqListExt-v1350, InterFreqCarrierFreqListExt-v1360 and/or
	30, it includes the same number of entries, and listed in the same order, as in
interFreqCarrierFreqListExt-r12.	
interFreqNeighCellList	
	ring cells with specific cell re-selection parameters.
interFreqNeighHSDN-CellList	
List of inter-frequency neighbour	ring HSDN cells as specified in TS 36.304 [4].
multiBandInfoList	
	ands in addition to the band represented by dl-CarrierFreq for which cell reselection
parameters are common E-LITE	RAN indicates at most <i>maxMultiBands</i> frequency bands (i.e. the total number of entrie
	nd <i>multiBandInfoList-v9e0</i> is below this limit).
multiBandInfoList-v10j0	
	ditionalSpectrumEmission values, as defined in TS 36.101 [42], table 6.2.4-1, for UEs
	S 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, for the frequency bands in
<i>multiBandInfoList</i> (i.e. without ຣເ	uffix) and multiBandInfoList-v9e0. If E-UTRAN includes multiBandInfoList-v10j0, it
	tries, and listed in the same order, as in <i>multiBandInfoList</i> (i.e. without suffix). If E-
	List-v10/0 it includes the same number of entries, and listed in the same order, as in
multiBandInfoList-v10j0.	
p-Max	
	Nuring E LITEA colle on this carrier frequency. If abcent the LIE englise the maximum
value applicable for the heighbo	buring E-UTRA cells on this carrier frequency. If absent the UE applies the maximum
power according to its capability	as specified in TS 36.101 [42], clause 6.2.2.
power according to its capability q-OffsetCell	· · · ·
oower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.	· · · ·
oower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.	· · · ·
oower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.: q-OffsetFreq	304 [4].
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS	304 [4].
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin	304 [4]. S 36.304 [4].
bower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30	304 [4]. S 36.304 [4].
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1.	304 [4]. 5 36.304 [4]. 4 [4]. If the field is not present, the UE applies the (default) value of negative infinity fo
bower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo	304 [4]. 5 36.304 [4]. 14 [4]. If the field is not present, the UE applies the (default) value of negative infinity fo
bower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo f this field is present and support	304 [4]. § 36.304 [4]. 4 [4]. If the field is not present, the UE applies the (default) value of negative infinity for <i>Is</i> rted by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ
bower according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo f this field is present and support	304 [4]. 5 36.304 [4]. 14 [4]. If the field is not present, the UE applies the (default) value of negative infinity fo
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo If this field is present and support measurement on all OFDM sym	304 [4]. § 36.304 [4]. 4 [4]. If the field is not present, the UE applies the (default) value of negative infinity for <i>Is</i> rted by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo If this field is present and support measurement on all OFDM sym q-QualMinWB	304 [4]. 5 36.304 [4]. 4 [4]. If the field is not present, the UE applies the (default) value of negative infinity for <i>Is</i> rted by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ bols in accordance with TS 36.214 [48]. NOTE 1.
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo If this field is present and support measurement on all OFDM sym q-QualMinWB If this field is present and support	304 [4]. 304 [4]. 4 [4]. If the field is not present, the UE applies the (default) value of negative infinity for <i>Is</i> rted by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ bols in accordance with TS 36.214 [48]. NOTE 1. rted by the UE, the UE shall, when performing RSRQ measurements, use a wider
power according to its capability q-OffsetCell Parameter "Qoffset _{s,n} " in TS 36.3 q-OffsetFreq Parameter "Qoffset _{frequency} " in TS q-QualMin Parameter "Q _{qualmin} " in TS 36.30 Q _{qualmin} . NOTE 1. q-QualMinRSRQ-OnAllSymbo If this field is present and support measurement on all OFDM sym q-QualMinWB	304 [4]. 304 [4]. 4 [4]. If the field is not present, the UE applies the (default) value of negative infinity for <i>Is</i> rted by the UE, the UE shall, when performing RSRQ measurements, perform RSRQ bols in accordance with TS 36.214 [48]. NOTE 1. rted by the UE, the UE shall, when performing RSRQ measurements, use a wider

SystemInformationBlockType5 field descriptions				
redistributionFactorCell				
Parameter redistributionFactorCell in TS 36.304 [4].				
reducedMeasPerformance				
Value <i>TRUE</i> indicates that the neighbouring inter-frequency is configured for reduced measurement performance, see				
TS 36.133 [16]. If the field is not included, the neighbouring inter-frequency is configured for normal measurement				
performance, see TS 36.133 [16].				
scptm-FreqOffset				
Parameter QoffsetsCPTM in TS 36.304 [4]. Actual value QoffsetsCPTM = field value * 2 [dB]. If the field is not present, the				
UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4].				
threshX-High				
Parameter "Thresh _X , _{High} " in TS 36.304 [4].				
threshX-HighQ				
Parameter "Threshx, HighQ" in TS 36.304 [4].				
threshX-Low				
Parameter "Thresh _{X, LowP} " in TS 36.304 [4].				
threshX-LowQ				
Parameter "Thresh _{X, LowQ} " in TS 36.304 [4].				
t-ReselectionEUTRA				
Parameter "Treselection _{EUTRA} " in TS 36.304 [4].				
t-ReselectionEUTRA-SF				
Parameter "Speed dependent ScalingFactor for TreselectionEUTRA" in TS 36.304 [4]. If the field is not present, the UE				
behaviour is specified in TS 36.304 [4].				

NOTE 1: The value the UE applies for parameter "Q_{qualmin}" in TS 36.304 [4] depends on the *q*-QualMin fields signalled by E-UTRAN and supported by the UE. In case multiple candidate options are available, the UE shall select the highest priority candidate option according to the priority order indicated by the following table (top row is highest priority).

q-QualMinRSRQ-OnAllSymbols	q-QualMinWB	Value of parameter "Q _{qualmin} " in TS 36.304 [4]
Included	Included	q-QualMinRSRQ-OnAllSymbols – (q-QualMin – q-
		QualMinWB)
Included	Not included	q-QualMinRSRQ-OnAllSymbols
Not included	Included	q-QualMinWB
Not included	Not included	q-QualMin

Conditional presence	Explanation
dl-FreqMax	The field is mandatory present if, for the corresponding entry in <i>InterFreqCarrierFreqList</i> (i.e. without suffix), <i>dI-CarrierFreq</i> (i.e. without suffix) is set to <i>maxEARFCN</i> . Otherwise the field is not present.
QrxlevminCE1	The field is optionally present, Need OR, if <i>q-RxLevMinCE1-r13</i> is set below -140 dBm. Otherwise the field is not present.
RSRQ	The field is mandatory present if <i>threshServingLowQ</i> is present in systemInformationBlockType3; otherwise it is not present.
RSRQ2	The field is mandatory present for all EUTRA carriers listed in SIB5 if <i>q</i> -QualMinRSRQ- OnAllSymbols is present in SIB3; otherwise it is not present and the UE shall delete any existing value for this field.
WB-RSRQ	The field is optionally present, need OP if the measurement bandwidth indicated by <i>allowedMeasBandwidth</i> is 50 resource blocks or larger; otherwise it is not present.

SystemInformationBlockType6

The IE *SystemInformationBlockType6* contains information relevant only for inter-RAT cell re-selection i.e. information about UTRA frequencies and UTRA neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency.

SystemInformationBlockType6 information element

ASN1START			
SystemInformationBlockType6 ::= carrierFreqListUTRA-FDD carrierFreqListUTRA-TDD t-ReselectionUTRA	SEQUENCE { CarrierFreqListUTRA-FDD CarrierFreqListUTRA-TDD T-Reselection,	OPTIONAL, OPTIONAL,	Need OR Need OR

t-ReselectionUTRA-SF SpeedStateScaleFactors OPTIONAL, -- Need OP lateNonCriticalExtension OCTET STRING (CONTAINING SystemInformationBlockType6-OPTIONAL, v8h0-IEs) [[carrierFreqListUTRA-FDD-v1250 SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqInfoUTRA-v1250 OPTIONAL, -- Cond UTRA-FDD carrierFreqListUTRA-TDD-v1250 SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF CarrierFreqInfoUTRA-v1250 OPTIONAL, -- Cond UTRA-TDD carrierFreqListUTRA-FDD-Ext-r12 CarrierFreqListUTRA-FDD-Ext-r12 OPTIONAL, -- Cond UTRA-FDD carrierFreqListUTRA-TDD-Ext-r12 CarrierFreqListUTRA-TDD-Ext-r12 OPTIONAL -- Cond UTRA-TDD 11 } SystemInformationBlockType6-v8h0-IEs ::= SEQUENCE { carrierFreqListUTRA-FDD-v8h0 SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqInfoUTRA-FDD-v8h0 OPTIONAL, -- Cond UTRA-FDD nonCriticalExtension SEQUENCE { } OPTIONAL } CarrierFreqInfoUTRA-v1250 ::= SEQUENCE { ENUMERATED {true} reducedMeasPerformance-r12 OPTIONAL -- Need OP } SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqUTRA-FDD CarrierFreqListUTRA-FDD ::= CarrierFreqUTRA-FDD ::= SEQUENCE { ARFCN-ValueUTRA, carrierFreq cellReselectionPriority CellReselectionPriority OPTIONAL, -- Need OP threshX-High ReselectionThreshold, threshX-Low ReselectionThreshold, g-RxLevMin INTEGER (-60..-13), p-MaxUTRA INTEGER (-50..33), q-QualMin INTEGER (-24..0), [[threshX-Q-r9 SEQUENCE { threshX-HighQ-r9 ReselectionThresholdQ-r9, threshX-LowQ-r9 ReselectionThresholdQ-r9 } OPTIONAL -- Cond RSRO]] } CarrierFreqInfoUTRA-FDD-v8h0 ::= SEQUENCE { multiBandInfoList SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-UTRA-FDD OPTIONAL -- Need OR } CarrierFreqListUTRA-FDD-Ext-r12 ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF CarrierFreqUTRA-FDD-Ext-r12 CarrierFreqUTRA-FDD-Ext-r12 ::= SEOUENCE { carrierFreq-r12 ARFCN-ValueUTRA, cellReselectionPriority-r12 CellReselectionPriority OPTIONAL, -- Need OP threshX-High-r12 ReselectionThreshold, threshX-Low-r12 ReselectionThreshold, INTEGER (-60..-13), q-RxLevMin-r12 p-MaxUTRA-r12 INTEGER (-50..33), q-QualMin-r12 INTEGER (-24..0), SEQUENCE { threshX-Q-r12 threshX-HighQ-r12 ReselectionThresholdO-r9. threshX-LowQ-r12 ReselectionThresholdQ-r9 OPTIONAL, -- Cond RSRO multiBandInfoList-r12 SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-UTRA-FDD OPTIONAL, -- Need OR reducedMeasPerformance-r12 ENUMERATED {true} OPTIONAL, -- Need OP . . . } CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF CarrierFreqUTRA-TDD CarrierFregUTRA-TDD ::= SEOUENCE { carrierFreq ARFCN-ValueUTRA, CellReselectionPriority cellReselectionPriority OPTIONAL, -- Need OP threshX-High ReselectionThreshold, threshX-Low ReselectionThreshold, q-RxLevMin INTEGER (-60..-13), p-MaxUTRA INTEGER (-50..33), . . .

}					
CarrierFreqListUTRA-TDD-Ext-r12 ::= SEQ Car	UENCE (SIZE (1maxUTRA-TDD- rierFreqUTRA-TDD-r12	-Carrier)) OF			
CarrierFreqUTRA-TDD-r12 ::= SEQUENCE { carrierFreq-r12 cellReselectionPriority-r12 threshX-High-r12 threshX-Low-r12	ARFCN-ValueUTRA, CellReselectionPriority ReselectionThreshold, ReselectionThreshold,	OPTIONAL, Need OP			
q-RxLevMin-r12 p-MaxUTRA-r12 reducedMeasPerformance-r12	INTEGER (-6013), INTEGER (-5033), ENUMERATED {true}	OPTIONAL, Need OP			
}					
FreqBandIndicator-UTRA-FDD ::=	INTEGER (186)				
ASN1STOP					
SystemInf	ormationBlockType6 field desc	riptions			
carrierFreqListUTRA-FDD	······	- P P			
List of carrier frequencies of UTRA FDD. E-l frequency regardless of the ARFCN used to <i>carrierFreqListUTRA-FDD-v1250</i> , it includes <i>carrierFreqListUTRA-FDD</i> (i.e. without suffix	indicate this. If E-UTRAN include the same number of entries, and	s <i>carrierFreqListUTRA-FDD-v8h0</i> and/or listed in the same order, as in			
carrierFreqListUTRA-FDD-Ext					
List of additional carrier frequencies of UTRA	A EDD E-UTRAN does not confid	ure more than one entry for the same			
physical frequency regardless of the ARFCN					
Ext even if carrierFreqListUTRA-FDD (i.e wi					
carrierFreqListUTRA-TDD	,				
List of carrier frequencies of UTRA TDD. E-U	JTRAN does not configure more t	than one entry for the same physical			
frequency regardless of the ARFCN used to includes the same number of entries, and lis	indicate this If E-UTRAN includes	s carrierFreqListUTRA-TDD-v1250, it			
carrierFreqListUTRA-TDD-Ext					
List of additional carrier frequencies of UTR/ physical frequency regardless of the ARFCN	l used to indicate this. EUTRAN n	nay include carrierFreqListUTRA-TDD-			
Ext even if carrierFreqListUTRA-TDD (i.e wi	(nout sums) does not include max	UTRA-TDD-Camer entries.			
<i>multiBandInfoList</i> Indicates the list of frequency bands in addition to the band represented by carrierFreq in the <i>CarrierFreqUTRA-FDD</i> for which UTRA cell reselection parameters are common.					
p-MaxUTRA					
The maximum allowed transmission power of	on the (uplink) carrier frequency, s	see TS 25.304 [40]. In dBm			
q-QualMin					
Parameter "Q _{qualmin} " in TS 25.304 [40]. Actua	al value = field value [dB].				
q-RxLevMin Parameter "Q _{rxlevmin} " in TS 25.304 [40]. Actua	al value = field value * 2+1 [dBm].				
reducedMeasPerformance	fraguanavia configurad for radu	ad massurement performance and TC			
Value <i>TRUE</i> indicates that the UTRA carrier frequency is configured for reduced measurement performance, see TS 36.133 [16]. If the field is not included, the UTRA carrier frequency is configured for normal measurement performance, see TS 36.133 [16].					
t-ReselectionUTRA					
Parameter "Treselection _{utran} " in TS 36.304 [4].					
t-ReselectionUTRA-SF					
Parameter "Speed dependent ScalingFactor for Treselection _{UTRA} " in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].					
<i>threshX-High</i> Parameter "Thresh _{X, HighP} " in TS 36.304 [4].					
threshX-HighQ					
Parameter "Thresh _{X, HighQ} " in TS 36.304 [4].					
<i>threshX-Low</i> Parameter "Thresh _{X, LowP} " in TS 36.304 [4].					
threshX-LowQ					
Parameter "Thresh _{X, LowQ} " in TS 36.304 [4].	Parameter "Threshx, LowQ" in TS 36.304 [4].				

Conditional presence	Explanation
RSRQ	The field is mandatory present if the <i>threshServingLowQ</i> is present in
	systemInformationBlockType3; otherwise it is not present.
UTRA-FDD	The field is optionally present, need OR, if the <i>carrierFreqListUTRA-FDD</i> is present.
	Otherwise it is not present.
UTRA-TDD	The field is optionally present, need OR, if the <i>carrierFreqListUTRA-TDD</i> is present.
	Otherwise it is not present.

SystemInformationBlockType7

The IE *SystemInformationBlockType7* contains information relevant only for inter-RAT cell re-selection i.e. information about GERAN frequencies relevant for cell re-selection. The IE includes cell re-selection parameters for each frequency.

SystemInformationBlockType7 information element

ASN1START			
SystemInformationBlockType7 ::=	SEQUENCE {		
t-ReselectionGERAN	T-Reselection,		
t-ReselectionGERAN-SF	SpeedStateScaleFactors	OPTIONAL,	Need OR
carrierFreqsInfoList	CarrierFreqsInfoListGERAN	OPTIONAL,	Need OR
· · · · ,			
lateNonCriticalExtension	OCTET STRING	OPTIONAL	
}			
CarrierFreqsInfoListGERAN ::=	SEQUENCE (SIZE (1maxGNFG)) O	F CarrierFreqsInt	Eogeran
CarrierFreqsInfoGERAN ::=	SEQUENCE {		
carrierFreqs	CarrierFreqsGERAN,		
commonInfo	SEQUENCE {		
cellReselectionPriority	CellReselectionPriority	OPTIONAL,	Need OP
ncc-Permitted	BIT STRING (SIZE (8)),		
q-RxLevMin	INTEGER (045),		
p-MaxGERAN	INTEGER (039)	OPTIONAL,	Need OP
threshX-High	ReselectionThreshold,		
threshX-Low	ReselectionThreshold		
},			
}			
ASN1STOP			

SystemInformationBlockType7 field descriptions

carrierFreqs

The list of GERAN carrier frequencies organised into one group of GERAN carrier frequencies.

carrierFreqsInfoList

Provides a list of neighbouring GERAN carrier frequencies, which may be monitored for neighbouring GERAN cells. The GERAN carrier frequencies are organised in groups and the cell reselection parameters are provided per group of GERAN carrier frequencies.

commonInfo

Defines the set of cell reselection parameters for the group of GERAN carrier frequencies.

ncc-Permitted

Field encoded as a bit map, where bit N is set to "0" if a BCCH carrier with NCC = N-1 is not permitted for monitoring and set to "1" if the BCCH carrier with NCC = N-1 is permitted for monitoring; N = 1 to 8; bit 1 of the bitmap is the leading bit of the bit string.

p-MaxGERAN

Maximum allowed transmission power for GERAN on an uplink carrier frequency, see TS 45.008 [28]. Value in dBm. Applicable for the neighbouring GERAN cells on this carrier frequency. If *pmaxGERAN* is absent, the maximum power according to the UE capability is used.

q-RxLevMin

Parameter " $Q_{rxlevmin}$ " in TS 36.304 [4], minimum required RX level in the GSM cell. The actual value of $Q_{rxlevmin}$ in dBm = (field value * 2) – 115.

threshX-High

Parameter "Thresh_{X, High}P" in TS 36.304 [4].

threshX-Low

Parameter "Thresh_{X, LowP}" in TS 36.304 [4].

t-ReselectionGERAN

Parameter "TreselectionGERAN" in TS 36.304 [4].

t-ReselectionGERAN-SF

Parameter "Speed dependent ScalingFactor for Treselection_{GERAN}" in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

_

SystemInformationBlockType8

The IE *SystemInformationBlockType8* contains information relevant only for inter-RAT cell re-selection i.e. information about CDMA2000 frequencies and CDMA2000 neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

SystemInformationBlockType8 information element

ASN1START				
SystemInformationBlockType8 ::= SEQU	NCE {			
systemTimeInfo	ystemTimeInfo	CDMA2000	OPTIONAL	L, Need OR
searchWindowSize	NTEGER (015)	OPTIONAL	L, Need OR
parametersHRPD	EQUENCE {			
preRegistrationInfoHRPD	PreRegistr	ationInfoHRPD,		
cellReselectionParametersHRPD	CellResele	ctionParametersCDN	MA2000 OPT:	IONAL Need OR
}			OPTIONAL	L, Need OR
parameters1XRTT	EQUENCE {			
csfb-RegistrationParam1XRTT	CSFB-Regis	trationParam1XRTT	OPTIONAL	L, Need OP
longCodeState1XRTT		(SIZE (42))		L, Need OR
cellReselectionParameters1XRTT	CellResele	ctionParametersCDN	MA2000 OPT:	IONAL Need OR
}			OPTIONAL	L, Need OR
••••				
	CTET STRING		OPTIONAL	
[[csfb-SupportForDualRxUEs-r9			OPTIONAL	
cellReselectionParametersHRPD-v9	0 CellResele	ctionParametersCDI	MA2000-v920	OPTIONAL,
Cond NCL-HRPD				
cellReselectionParameters1XRTT-v	20 CellResele	ctionParametersCDI	MA2000-v920	OPTIONAL,
Cond NCL-1XRTT				
csfb-RegistrationParam1XRTT-v920	CSFB-Regis	trationParam1XRTT	-v920	OPTIONAL,
Cond REG-1XRTT				
ac-BarringConfig1XRTT-r9	AC-Barring	Config1XRTT-r9	OPTIONAL	Cond REG-
1XRTT				
]], [[(h	00000000	and DEC
[[csfb-DualRxTxSupport-r10	ENUMERATED	{true}	OPTIONAL	Cond REG-
1XRTT				
]], [[sib8-PerPLMN-List-r11		MN-List-r11	OPTIONAL	Need OR
[[sib8-PerPLMN-List-r11]]	SIB0-PerPL	MIN-DISC-LII	OPIIONAL	Need OR
L L				
\$				

```
CellReselectionParametersCDMA2000 ::= SEQUENCE {
   bandClassList
                                      BandClassListCDMA2000,
   neighCellList
                                      NeighCellListCDMA2000,
   t-ReselectionCDMA2000
                                 T-Reselection,
   t-ReselectionCDMA2000-SF
                                      SpeedStateScaleFactors
                                                                         OPTIONAL -- Need OP
}
CellReselectionParametersCDMA2000-r11 ::= SEQUENCE {
   bandClassList
                                      BandClassListCDMA2000,
   neighCellList-r11
                                      SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000-r11,
                                     T-Reselection,
SpeedStateScaleFactors
   t-ReselectionCDMA2000
   t-ReselectionCDMA2000-SF
                                                                         OPTIONAL -- Need OP
}
CellReselectionParametersCDMA2000-v920 ::= SEQUENCE {
   neighCellList-v920
                                          NeighCellListCDMA2000-v920
}
NeighCellListCDMA2000 ::=
                                  SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000
NeighCellCDMA2000 ::= SEQUENCE {
                                       BandclassCDMA2000,
   bandClass
   neighCellsPerFreqList
                                      NeighCellsPerBandclassListCDMA2000
}
NeighCellCDMA2000-r11 ::= SEQUENCE {
   bandClass
                                       BandclassCDMA2000,
                                       SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000-
   neighFreqInfoList-r11
r11
}
NeighCellsPerBandclassListCDMA2000 ::= SEQUENCE (SIZE (1..16)) OF NeighCellsPerBandclassCDMA2000
NeighCellsPerBandclassCDMA2000 ::= SEQUENCE {
   arfcn
                                       ARFCN-ValueCDMA2000
   physCellIdList
                                       PhysCellIdListCDMA2000
}
NeighCellsPerBandclassCDMA2000-r11 ::= SEQUENCE {
   arfcn
                                       ARFCN-ValueCDMA2000,
                                       SEQUENCE (SIZE (1..40)) OF PhysCellIdCDMA2000
   physCellIdList-r11
}
NeighCellListCDMA2000-v920 ::=
                                  SEQUENCE (SIZE (1..16)) OF NeighCellCDMA2000-v920
NeighCellCDMA2000-v920 ::=
                                 SEQUENCE {
   neighCellsPerFreqList-v920
                                     NeighCellsPerBandclassListCDMA2000-v920
NeighCellsPerBandclassListCDMA2000-v920 ::= SEQUENCE (SIZE (1..16)) OF
NeighCellsPerBandclassCDMA2000-v920
NeighCellsPerBandclassCDMA2000-v920 ::= SEQUENCE {
   physCellIdList-v920
                                       PhysCellIdListCDMA2000-v920
}
PhysCellIdListCDMA2000 ::=
                                  SEQUENCE (SIZE (1..16)) OF PhysCellIdCDMA2000
PhysCellIdListCDMA2000-v920 ::=
                                  SEQUENCE (SIZE (0..24)) OF PhysCellIdCDMA2000
BandClassListCDMA2000 ::=
                                   SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandClassInfoCDMA2000
BandClassInfoCDMA2000 ::= SEQUENCE {
   bandClass
                                       BandclassCDMA2000,
   cellReselectionPriority
                                       CellReselectionPriority
                                                                        OPTIONAL, -- Need OP
   threshX-High
                                       INTEGER (0..63),
                                      INTEGER (0..63),
   threshX-Low
}
AC-BarringConfig1XRTT-r9 ::=
                                  SEQUENCE {
                                      INTEGER (0..63),
   ac-Barring0to9-r9
                                       INTEGER (0..7),
   ac-Barring10-r9
   ac-Barring11-r9
                                       INTEGER (0..7),
   ac-Barring12-r9
                                      INTEGER (0..7),
                                       INTEGER (0..7),
   ac-Barring13-r9
   ac-Barring14-r9
                                     INTEGER (0..7),
```

```
ac-Barring15-r9
                                      INTEGER (0..7),
    ac-BarringMsg-r9
                                       INTEGER (0..7),
   ac-BarringReg-r9
                                       INTEGER (0..7),
   ac-BarringEmg-r9
                                       INTEGER (0..7)
}
SIB8-PerPLMN-List-r11 ::=
                                  SEQUENCE (SIZE (1. maxPLMN-r11)) OF SIB8-PerPLMN-r11
SIB8-PerPLMN-r11 ::=
                                   SEQUENCE {
   plmn-Identity-r11
                                       INTEGER (1..maxPLMN-r11),
   parametersCDMA2000-r11
                                       CHOICE {
        explicitValue
                                           ParametersCDMA2000-r11,
       defaultValue
                                           NULT.
    }
}
ParametersCDMA2000-r11 ::=
systemTimeInfo-r11
explicitValue
                                  SEOUENCE {
                                      CHOICE {
       explicitValue
                                          SystemTimeInfoCDMA2000,
       defaultValue
                                           NULL
    }
                                                                  OPTIONAL, -- Need OR
    searchWindowSize-r11
                                      INTEGER (0..15),
    parametersHRPD-r11
                                      SEOUENCE {
       preRegistrationInfoHRPD-r11
                                        PreRegistrationInfoHRPD,
       cellReselectionParametersHRPD-r11 CellReselectionParametersCDMA2000-r11 OPTIONAL -- Need
OR
   parameters1XRTT-r11
                                      SEQUENCE {
       csfb-RegistrationParam1XRTT-r11 CSFB-RegistrationParam1XRTT
                                                                             OPTIONAL, -- Need OP
       csfb-RegistrationParamlXRTT-Ext-r11 CSFB-RegistrationParamlXRTT-v920 OPTIONAL, -- Cond
REG-1XRTT-PerPLMN
                                          BIT STRING (SIZE (42)) OPTIONAL, -- Cond PerPLMN-LC
       longCodeState1XRTT-r11
       cellReselectionParameters1XRTT-r11 CellReselectionParametersCDMA2000-r11 OPTIONAL, --
Need OR
                                          AC-BarringConfig1XRTT-r9
       ac-BarringConfig1XRTT-r11
                                                                             OPTIONAL, -- Cond
REG-1XRTT-PerPLMN
      R'I'I'-PERPLANN
csfb-SupportForDualRxUEs-r11
                                          BOOLEAN
                                                                             OPTIONAL, -- Need OR
       csfb-DualRxTxSupport-r11
                                          ENUMERATED {true} OPTIONAL -- Cond REG-1XRTT-
PerPLMN
           OPTIONAL, -- Need OR
  }
    . . .
}
```

-- ASN1STOP

SystemInformationBlockType8 field descriptions

ac-BarringConfig1XRTT Contains the access class barring parameters the UE uses to calculate the access class barring factor, see C.S0097 [53]. ac-Barring0to9 Parameter used for calculating the access class barring factor for access overload classes 0 through 9. It is the parameter "PSIST" in C.S0004 [34] for access overload classes 0 through 9. ac-BarringEmg Parameter used for calculating the access class barring factor for emergency calls and emergency message transmissions for access overload classes 0 through 9. It is the parameter "PSIST_EMG" in C.S0004 [34].

ac-BarringMsg

```
Parameter used for modifying the access class barring factor for message transmissions. It is the parameter "MSG_PSIST" in C.S0004 [34].
```

ac-BarringN

Parameter used for calculating the access class barring factor for access overload class N (N = 10 to 15). It is the parameter "PSIST" in C.S0004 [34] for access overload class N.

ac-BarringReg

Parameter used for modifying the access class barring factor for autonomous registrations. It is the parameter "REG_PSIST" in C.S0004 [34].

bandClass

Identifies the Frequency Band in which the Carrier can be found. Details can be found in C.S0057 [24, Table 1.5].

bandClassList

List of CDMA2000 frequency bands.

	SystemInformationBlockType8 field descriptions
cellReselectionP	arameters1XRTT
	arameters applicable only to CDMA2000 1xRTT system.
	arameters1XRTT-Ext arameters applicable for cell reselection to CDMA2000 1XRTT system.
	arameters 1XRTT-v920
	arameters applicable for cell reselection to CDMA2000 1XRTT system. The field is not present if
cellReselectionPa	rameters1XRTT is not present; otherwise it is optionally present.
cellReselectionP	arametersHRPD
	arameters applicable for cell reselection to CDMA2000 HRPD system
	arametersHRPD-Ext
	arameters applicable for cell reselection to CDMA2000 HRPD system.
	arameters applicable for cell reselection to CDMA2000 HRPD system. The field is not present rametersHRPD is not present; otherwise it is optionally present.
csfb-DualRxTxS	
	ates that the network supports dual Rx/Tx enhanced 1xCSFB, which enables UEs capable of dual xCSFB to switch off their 1xRTT receiver/transmitter while camped in E-UTRAN [51].
csfb-Registration	
Registration. This	ameters the UE will use to determine if it should perform a CDMA2000 1xRTT Registration/R field is included if either CSFB or enhanced CS fallback to CDMA2000 1xRTT is supported.
csfb-SupportFor	DualRxUEs
Value TRUE indic	ates that the network supports dual Rx CSFB [51].
longCodeState12	(RTT
	code generation registers in CDMA2000 1XRTT system as defined in C.S0002 [12], clause 1.3,
$ t/10 \times 10 + 3$	20 ms, where <i>t</i> equals to the <i>cdma</i> -SystemTime. This field is required for reporting CGI for 1xRT
SRVCC handover is excluded when	and enhanced CS fallback to CDMA2000 1xRTT operation. Otherwise this IE is not needed. This fie estimating changes in system information, i.e. changes of <i>longCodeState1XRTT</i> should neither resu tion change notifications nor in a modification of systemInfoValueTag in SIB1.
neighCellList	ion onaligo notino atone nor in a modification of operandorag in orbiti
List of CDMA2000	neighbouring cells. The total number of neighbouring cells in neighCellList for each RAT (1XRTT)
HRPD) is limited t neighCellList-v9	
Extended List of C	20 CDMA2000 neighbouring cells. The combined total number of CDMA2000 neighbouring cells in both neighCellList-v920 is limited to 32 for HRPD and 40 for 1xRTT.
neighCellsPerFr	
List of carrier free	uencies and neighbour cell ids in each frequency within a CDMA2000 Band, see C.S0002 [12]
C.S0024 [26]. neighCellsPerFre	eaList-v920
	ighbour cell ids, in the same CDMA2000 Frequency Band as the corresponding instance in
parameters1XRT	Τ
	able for interworking with CDMA2000 1XRTT system.
parametersCDM	42000
	esponding SIB8 parameters for the CDMA2000 network associated with the PLMN indicated in plm
Identity. A choice	is used to indicate whether for this PLMN the parameters are signalled explicitly or set to the (defau or all PLMNs i.e. the values not included in <i>sib8-PerPLMN-List</i> .
parametersHRPL	
	able only for interworking with CDMA2000 HRPD systems.
physCellIdList	
-	f CDMA2000 cell ids, see C.S0002 [12] or C.S0024 [26].
physCellIdList-v	920
	DMA2000 cell ids, in the same CDMA2000 ARFCN as the corresponding instance in ndclassCDMA2000".

SystemInformationBlockType8 field descriptions

plmn-Identity

Indicates the PLMN associated with this CDMA2000 network. Value 1 indicates the PLMN listed 1st in the 1st *plmn-ldentityList* included in SIB1, value 2 indicates the PLMN listed 2nd in the same *plmn-ldentityList*, or when no more PLMN are present within the same *plmn_identityList*, then the PLMN listed 1st in the subsequent *plmn-ldentityList* within the same *sl*B1 and so on. A PLMN which identity is not indicated in the *sib8-PerPLMN-List*, does not support inter-working with CDMA2000.

preRegistrationInfoHRPD

The CDMA2000 HRPD Pre-Registration Information tells the UE if it should pre-register with the CDMA2000 HRPD network and identifies the Pre-registration zone to the UE.

searchWindowSize

The search window size is a CDMA2000 parameter to be used to assist in searching for the neighbouring pilots. For values see C.S0005 [25], Table 2.6.6.2.1-1, and C.S0024 [26], Table 8.7.6.2-4. This field is required for a UE with *rx-ConfigHRPD= single* and/ or *rx-Config1XRTT= single* to perform handover, cell re-selection, UE measurement based redirection and enhanced 1xRTT CS fallback from E-UTRAN to CDMA2000 according to this specification and TS 36.304 [4].

sib8-PerPLMN-List

This field provides the values for the interworking CDMA2000 networks corresponding, if any, to the UE's RPLMN. systemTimeInfo

Information on CDMA2000 system time. This field is required for a UE with *rx-ConfigHRPD= single* and/ or *rx-Config1XRTT= single* to perform handover, cell re-selection, UE measurement based redirection and enhanced 1xRTT CS fallback from E-UTRAN to CDMA2000 according to this specification and TS 36.304 [4]. This field is excluded when estimating changes in system information, i.e. changes of *systemTimeInfo* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1.

For the field included in *ParametersCDMA2000*, a choice is used to indicate whether for this PLMN the parameters are signalled explicitly or set to the (default) value common for all PLMNs i.e. the value not included in *sib8-PerPLMN-List*.

threshX-High

Parameter "Thresh_{X, HighP}" in TS 36.304 [4]. This specifies the high threshold used in reselection towards this CDMA2000 band class expressed as an unsigned binary number equal to FLOOR ($-2 \times 10 \times \log_{10} E_c/I_o$) in units of 0.5 dB, as defined in C.S0005 [25].

threshX-Low

Parameter "Thresh_{X, LowP}" in TS 36.304 [4]. This specifies the low threshold used in reselection towards this CDMA2000 band class expressed as an unsigned binary number equal to FLOOR (-2 x 10 x $\log_{10} E_o/I_o$) in units of 0.5 dB, as defined in C.S0005 [25].

t-ReselectionCDMA2000

Parameter "Treselection_{CDMA_HRPD}" or "Treselection_{CDMA_1xRTT}" in TS 36.304 [4].

t-ReselectionCDMA2000-SF

Parameter "Speed dependent ScalingFactor for Treselection_{CDMA-HRPD}" or Treselection_{CDMA-1xRTT}" in TS 36.304 [4]. If the field is not present, the UE behaviour is specified in TS 36.304 [4].

Conditional presence	Explanation
NCL-1XRTT	The field is optional present, need OR, if <i>cellReselectionParameters1xRTT</i> is present;
	otherwise it is not present.
NCL-HRPD	The field is optional present, need OR, if <i>cellReselectionParametersHRPD</i> is present;
	otherwise it is not present.
PerPLMN-LC	The field is optional present, need OR, when systemTimeInfo is included in
	SIB8PerPLMN for this CDMA2000 network; otherwise it is not present.
REG-1XRTT	The field is optional present, need OR, if <i>csfb-RegistrationParam1XRTT</i> is present;
	otherwise it is not present.
REG-1XRTT-PerPLMN	The field is optional present, need OR, if csfb-RegistrationParam1XRTT is included in
	SIB8PerPLMN for this CDMA2000 network; otherwise it is not present.

_

SystemInformationBlockType9

The IE SystemInformationBlockType9 contains a home eNB name (HNB Name).

SystemInformationBlockType9 information element

ASN1START			
SystemInformationBlockType9 ::= hnb-Name	SEQUENCE { OCTET STRING (SIZE(148))	OPTIONAL,	Need OR

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}	lateNonCriticalExtension	OCTET STRING	OPTIONAL
i	ASN1STOP		

hnb-Name

Carries the name of the home eNB, coded in UTF-8 with variable number of bytes per character, see TS 22.011 [10].

SystemInformationBlockType9 field descriptions

SystemInformationBlockType10

The IE SystemInformationBlockType10 contains an ETWS primary notification.

SystemInformationBlockType10 information element

ASN1START			
SystemInformationBlockTypel0 ::= messageIdentifier serialNumber warningType dummy	SEQUENCE { BIT STRING (SIZE (16)), BIT STRING (SIZE (16)), OCTET STRING (SIZE (2)), OCTET STRING (SIZE (50))	OPTIONAL,	Need OP
<pre>lateNonCriticalExtension }</pre>	OCTET STRING	OPTIONAL	

-- ASN1STOP

SystemInformationBlockType10 field descriptions

messageldentifier

Identifies the source and type of ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.44) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.1, while the trailing bit contains bit 0 of the second octet of the same equivalent IE.

serialNumber

Identifies variations of an ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.45), contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.2, while the trailing bit contains bit 0 of the second octet of the same equivalent IE.

dummy

This field is not used in the specification. If received it shall be ignored by the UE.

warningType

Identifies the warning type of the ETWS primary notification and provides information on emergency user alert and UE popup. The first octet (which is equivalent to the first octet of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.50) contains the first octet of the equivalent IE defined in and encoded according to TS 23.041 [37], clause 9.3.24, and so on.

SystemInformationBlockType11

The IE SystemInformationBlockType11 contains an ETWS secondary notification.

SystemInformationBlockType11 information element

ASN1START		
SystemInformationBlockTypel1 ::= messageIdentifier serialNumber	SEQUENCE { BIT STRING (SIZE (16)), BIT STRING (SIZE (16)),	
warningMessageSegmentType warningMessageSegmentNumber warningMessageSegment	ENUMERATED {notLastSegment, INTEGER (063), OCTET STRING,	<pre>lastSegment { ,</pre>
dataCodingScheme	OCTET STRING (SIZE (1))	OPTIONAL, Cond Segment1
lateNonCriticalExtension	OCTET STRING	OPTIONAL

}

-- ASN1STOP

SystemInformationBlockType11 field descriptions

dataCodingScheme

Identifies the alphabet/coding and the language applied variations of an ETWS notification. The octet (which is equivalent to the octet of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.52), contains the octet of the equivalent IE defined in TS 23.041 [37], clause 9.4.3.2.3, and encoded according to TS 23.038 [38].

messageldentifier

Identifies the source and type of ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.44), contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.1, while the trailing bit contains bit 0 of second octet of the same equivalent IE.

serialNumber

Identifies variations of an ETWS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.45) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.2, while the trailing bit contains bit 0 of second octet of the same equivalent IE.

warningMessageSegment

Carries a segment of the *Warning Message Contents* IE defined in TS 36.413 [39], clause 9.2.1.53. The first octet of the *Warning Message Contents* IE is equivalent to the first octet of the *CB data* IE defined in and encoded according to TS 23.041 [37], clause 9.4.2.2.5, and so on.

warningMessageSegmentNumber

Segment number of the ETWS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on.

warningMessageSegmentType

Indicates whether the included ETWS warning message segment is the last segment or not.

Conditional presence	Explanation
Segment1	The field is mandatory present in the first segment of SIB11, otherwise it is not present.

- SystemInformationBlockType12

The IE SystemInformationBlockType12 contains a CMAS notification.

SystemInformationBlockType12 information element

ASN1START	
SystemInformationBlockType12-r9 ::= SEQU	UENCE {
messageIdentifier-r9	BIT STRING (SIZE (16)),
serialNumber-r9	BIT STRING (SIZE (16)),
warningMessageSegmentType-r9	ENUMERATED {notLastSegment, lastSegment},
warningMessageSegmentNumber-r9	INTEGER (063),
warningMessageSegment-r9	OCTET STRING,
dataCodingScheme-r9	OCTET STRING (SIZE (1)) OPTIONAL, Cond Segment1
lateNonCriticalExtension	OCTET STRING OPTIONAL,
••••	
[[warningAreaCoordinatesSegment-r]	15 OCTET STRING OPTIONAL Need OR
]]	
}	

-- ASN1STOP

SystemInformationBlockType12 field descriptions

dataCodingScheme

Identifies the alphabet/coding and the language applied variations of a CMAS notification. The octet (which is equivalent to the octet of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.52), contains the octet of the equivalent IE defined in TS 23.041 [37], clause 9.4.3.2.3, and encoded according to TS 23.038 [38].

SystemInformationBlockType12 field descriptions messageldentifier Identifies the source and type of CMAS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.44) contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.1, while the trailing bit contains bit 0 of second octet of the same equivalent IE. serialNumber Identifies variations of a CMAS notification. The leading bit (which is equivalent to the leading bit of the equivalent IE defined in TS 36.413 [39], clause 9.2.1.45), contains bit 7 of the first octet of the equivalent IE, defined in and encoded according to TS 23.041 [37], clause 9.4.3.2.2, while the trailing bit contains bit 0 of second octet of the same equivalent IE. warningAreaCoordinatesSegment If present, carries a segment, with one or more octets, of the geographical area where the CMAS warning message is valid as defined in [98]. The first octet of the first warningAreaCoordinatesSegment is equivalent to the first octet of Warning Area Coordinates IE defined in and encoded according to TS 23.041 [37] and so on. warningMessageSegment Carries a segment, with one or more octets, of the Warning Message Contents IE defined in TS 36.413 [39]. The first octet of the Warning Message Contents IE is equivalent to the first octet of the CB data IE defined in and encoded according to TS 23.041 [37], clause 9.4.2.2.5, and so on. warningMessageSegmentNumber Segment number of the CMAS warning message segment contained in the SIB. A segment number of zero corresponds to the first segment, one corresponds to the second segment, and so on. If warning area coordinates are provided for the warning message, then this field applies to both warning message segment and warning area coordinates segment. warningMessageSegmentType Indicates whether the included CMAS warning message segment is the last segment or not. If warning area coordinates are provided for the warning message, then this field applies to both warning message segment and warning area coordinates segment.

Conditional presence	Explanation	
Segment1	The field is mandatory present in the first segment of SIB12, otherwise it is not present.	

SystemInformationBlockType13

The IE SystemInformationBlockType13 contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

SystemInformationBlockType13 information element

ASN1START		
SystemInformationBlockType13-r9 ::= SEQU	L. L	
mbsfn-AreaInfoList-r9	MBSFN-AreaInfoList-r9,	
notificationConfig-r9	MBMS-NotificationConfig-r9,	
lateNonCriticalExtension	OCTET STRING	OPTIONAL,
• • • • •		
[[
notificationConfig-v1430	MBMS-NotificationConfig-v1430	OPTIONAL
]]		
}		
,		

-- ASN1STOP

SystemInformationBlockType13 field descriptions

notificationConfig Indicates the MBMS notification related configuration parameters. The UE shall ignore this field when *dl-Bandwidth* included in *MasterInformationBlock* is set to n6.

SystemInformationBlockType14

The IE SystemInformationBlockType14 contains the EAB parameters.

-- ASN1START SystemInformationBlockType14-r11 ::= SEQUENCE { CHOICE { eab-Param-r11 eab-Common-r11 EAB-Config-r11, eab-PerPLMN-List-r11 SEQUENCE (SIZE (1..maxPLMN-r11)) OF EAB-ConfigPLMNr11 OPTIONAL, -- Need OR lateNonCriticalExtension OCTET STRING OPTIONAL, [[eab-PerRSRP-r15 ENUMERATED {thresh0, thresh1, thresh2, thresh3} OPTIONAL --Need OR]] } EAB-ConfigPLMN-r11 ::= SEQUENCE { eab-Config-r11 EAB-Config-r11 OPTIONAL -- Need OR } EAB-Config-r11 ::= SEQUENCE { eab-Category-r11 ENUMERATED {a, b, c}, eab-BarringBitmap-r11 BIT STRING (SIZE (10)) }

SystemInformationBlockType14 information element

-- ASN1STOP

SystemInformationBlockType14 field descriptions

eab-BarringBitmap

Extended access class barring for AC 0-9. The first/ leftmost bit is for AC 0, the second bit is for AC 1, and so on. *eab-Category*

Indicates the category of UEs for which EAB applies. Value *a* corresponds to all UEs, value *b* corresponds to the UEs that are neither in their HPLMN nor in a PLMN that is equivalent to it, and value *c* corresponds to the UEs that are neither in the PLMN listed as most preferred PLMN of the country where the UEs are roaming in the operator-defined PLMN selector list on the USIM, nor in their HPLMN nor in a PLMN that is equivalent to their HPLMN, see TS 22.011 [10].

eab-Common

The EAB parameters applicable for all PLMN(s).

eab-PerPLMN-List

The EAB parameters per PLMN, listed in the same order as the PLMN(s) listed across the *plmn-IdentityList* fields in *SystemInformationBlockType1*.

eab-PerRSRP

-- ASN1START

Access barring per RSRP. Value *thresh0* means access to the cell is barred when in enhanced coverage as specified in TS 36.304 [4] and does not apply to UEs satisfying S criteria for normal coverage. Value *thresh1* is compared to the first entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList*, value thresh2 is compared to the second entry configured in *rsrp-ThresholdsPrachInfoList* and so on.

SystemInformationBlockType15

The IE SystemInformationBlockType15 contains the MBMS Service Area Identities (SAI) of the current and/ or neighbouring carrier frequencies.

SystemInformationBlockType15 information element

SystemInformationBlockType15-r11 ::= SEOUENCE { OPTIONAL, mbms-SAI-IntraFreq-r11 -- Need OR MBMS-SAI-List-r11 mbms-SAI-InterFreqList-r11 OPTIONAL, MBMS-SAI-InterFreqList-r11 -- Need OR lateNonCriticalExtension OPTIONAL, OCTET STRING [[mbms-SAI-InterFreqList-v1140 MBMS-SAI-InterFreqList-v1140 OPTTONAL -- Cond InterFreq]], mbms-IntraFreqCarrierType-r14 MBMS-CarrierType-r14 OPTIONAL, -- Need OR]]] mbms-InterFreqCarrierTypeList-r14 MBMS-InterFreqCarrierTypeList-r14 OPTIONAL -- Need OR]]

```
}
MBMS-SAI-List-r11 ::=
                                       SEQUENCE (SIZE (1..maxSAI-MBMS-r11)) OF MBMS-SAI-r11
MBMS-SAI-r11 ::=
                                       INTEGER (0..65535)
MBMS-SAI-InterFreqList-r11 ::=
                                       SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-r11
MBMS-SAI-InterFreqList-v1140 ::=
                                      SEQUENCE (SIZE (1..maxFreq)) OF MBMS-SAI-InterFreq-v1140
MBMS-SAI-InterFreq-r11 ::=
                                      SEQUENCE {
   dl-CarrierFreq-r11
                                          ARFCN-ValueEUTRA-r9,
   mbms-SAI-List-r11
                                          MBMS-SAI-List-r11
}
                                    SEQUENCE {
MBMS-SAI-InterFreq-v1140 ::=
                                          MultiBandInfoList-r11 OPTIONAL -- Need OR
       multiBandInfoList-r11
}
MBMS-InterFreqCarrierTypeList-r14 ::= SEQUENCE (SIZE (1..maxFreq)) OF MBMS-CarrierType-r14
MBMS-CarrierType-r14 ::=
                                       SEQUENCE {
   carrierType-r14
                                           ENUMERATED {mbms, fembmsMixed, fembmsDedicated},
   frameOffset-r14
                                          INTEGER (0..3)
                                                                          OPTIONAL -- Need OR
}
```

```
-- ASN1STOP
```

SystemInformationBlockType15 field descriptions	
carrierType	
Indicates whether the carrier is pre-Rel-14 MBMS carrier (mbms) or FeMBMS/Unicast mixed carrier	(fembmsMixed) or
MBMS-dedicated carrier (fembmsDedicated).	
frameOffset	
For MBMS-dedicated carrier, the frameOffset gives the radio frame which contains PBCH by SFN m	od 4 =
frameOffset.	
mbms-InterFreqCarrierTypeList	
Indicates whether this is an feMBMS carrier. The field is included only if mbms-SAI-InterFreqList-r11	is included. The
number of entries is the same in both fields and carrier type relates to the frequency indicated in mbi	ms-SAI-
InterFreqList-r11 in the corresponding entry index.	
mbms-IntraFreqCarrierType	
Contains indication whether the carrier is pre-Rel-14 MBMS carrier, FeMBMS/Unicast mixed carrier	or MBMS-
dedicated carrier.	
mbms-SAI-InterFreqList	
Contains a list of neighboring frequencies including additional bands, if any, that provide MBMS serv	ices and the
corresponding MBMS SAIs.	
mbms-SAI-IntraFreq	
Contains the list of MBMS SAIs for the current frequency. A duplicate MBMS SAI indicates that this a	and all following
SAIs are not offered by this cell but only by neighbour cells on the current frequency. For MBMS service	
UE shall use all MBMS SAIs listed in mbms-SAI-IntraFreq to derive the MBMS frequencies of interest	st.
mbms-SAI-List	
Contains a list of MBMS SAIs for a specific frequency.	
multiBandInfoList	
A list of additional frequency bands applicable for the cells participating in the MBSFN transmission.	
Conditional presence Explanation	

Conditional presence Explanation InterFreq The field is optionally present, need OR, if the mbms-SAI-InterFreqList-r11 is present. Otherwise it is not present. Otherwise it is not present.

SystemInformationBlockType16

The IE *SystemInformationBlockType16* contains information related to GPS time and Coordinated Universal Time (UTC). The UE may use the parameters provided in this system information block to obtain the UTC, the GPS and the local time.

NOTE: The UE may use the time information for numerous purposes, possibly involving upper layers e.g. to assist GPS initialisation, to synchronise the UE clock (a.o. to determine MBMS session start/ stop).

SystemInformationBlockType16 information element

SystemInformationBlockType16-r11 ::=	SEQUENCE {	
timeInfo-r11	SEQUENCE {	
timeInfoUTC-r11	INTEGER (054975581388	37),
dayLightSavingTime-r11	BIT STRING (SIZE (2))	OPTIONAL, Need OR
leapSeconds-r11	INTEGER (-127128)	OPTIONAL, Need OR
localTimeOffset-r11	INTEGER (-6364)	OPTIONAL Need OR
}		OPTIONAL, Need OR
lateNonCriticalExtension	OCTET STRING	OPTIONAL,
• • • • ,		
[[timeReferenceInfo-r15	TimeReferenceInfo-r15	OPTIONAL Need OR
]]		
1		

-- ASN1STOP

-- ASN1START

SystemInformationBlockType16 field descriptions

It indicates if and how daylight saving time (DST) is applied to obtain the local time. The semantics is the same as the semantics of the *Daylight Saving Time* IE in TS 24.301 [35] and TS 24.008 [49]. The first/leftmost bit of the bit string contains the b2 of octet 3, i.e. the value part of the *Daylight Saving Time* IE, and the second bit of the bit string contains b1 of octet 3.

leapSeconds

dayLightSavingTime

Number of leap seconds offset between GPS Time and UTC. UTC and GPS time are related i.e. GPS time - *leapSeconds* = UTC time.

localTimeOffset

Offset between UTC and local time in units of 15 minutes. Actual value = field value * 15 minutes. Local time of the day is calculated as UTC time + *localTimeOffset*.

timeInfoUTC

Coordinated Universal Time corresponding to the SFN boundary at or immediately after the ending boundary of the SI-window in which *SystemInformationBlockType16* is transmitted. The field counts the number of UTC seconds in 10 ms units since 00:00:00 on Gregorian calendar date 1 January, 1900 (midnight between Sunday, December 31, 1899 and Monday, January 1, 1900). NOTE 1.

This field is excluded when estimating changes in system information, i.e. changes of *timeInfoUTC* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1.

NOTE 1: The UE may use this field together with the leapSeconds field to obtain GPS time as follows: GPS Time (in seconds) = timeInfoUTC (in seconds) - 2,524,953,600 (seconds) + leapSeconds, where 2,524,953,600 is the number of seconds between 00:00:00 on Gregorian calendar date 1 January, 1900 and 00:00:00 on Gregorian calendar date 6 January, 1980 (start of GPS time).

SystemInformationBlockType17

The IE *SystemInformationBlockType17* contains information relevant for traffic steering between E-UTRAN and WLAN.

SystemInformationBlockType17 information element

ASN1START	
SystemInformationBlockType17-r12 ::= SEQUENCE { wlan-OffloadInfoPerPLMN-List-r12 SEQUENCE (SIZE (1maxPLMN-r11)) OF WLAN-OffloadInfoPerPLMN-r12 OPTIONAL, Need OR	
lateNonCriticalExtension OCTET STRING OPTIONAL,	
}	
WLAN-OffloadInfoPerPLMN-r12 ::=SEQUENCE {wlan-OffloadConfigCommon-r12WLAN-OffloadConfig-r12OPTIONAL, Need ORwlan-Id-List-r12WLAN-Id-List-r12OPTIONAL, Need OR	
}	
WLAN-Id-List-r12 ::= SEQUENCE (SIZE (1maxWLAN-Id-r12)) OF WLAN-Identifiers-r12	
WLAN-Identifiers-r12 ::= SEQUENCE {	

ssid-r12	OCTET STRING (SIZE (132))	OPTIONAL, Need OR
bssid-r12	OCTET STRING (SIZE (6))	OPTIONAL, Need OR
hessid-r12	OCTET STRING (SIZE (6))	OPTIONAL, Need OR

```
}
```

-- ASN1STOP

SystemInformationBlockType17 field descriptions

 bssid

 Basic Service Set Identifier (BSSID) defined in IEEE 802.11-2012 [67].

 hessid

 Homogenous Extended Service Set Identifier (HESSID) defined in IEEE 802.11-2012 [67].

 ssid

 Service Set Identifier (SSID) defined in IEEE 802.11-2012 [67].

 wlan-OffloadInfoPerPLMN-List

 The WLAN offload configuration per PLMN includes the same number of entries, listed in the same order as the PLMN(s) listed across the plmn-IdentityList fields in SystemInformationBlockType1.

SystemInformationBlockType18

The IE SystemInformationBlockType18 indicates E-UTRAN supports the sidelink UE information procedure and may contain sidelink communication related resource configuration information.

SystemInformationBlockType18 information element

ASN1START		
SystemInformationBlockType18-r12 ::= SEG	QUENCE {	
commConfig-r12	SEQUENCE {	
commRxPool-r12	SL-CommRxPoolList-r12,	
commTxPoolNormalCommon-r12	SL-CommTxPoolList-r12	OPTIONAL, Need OR
commTxPoolExceptional-r12	SL-CommTxPoolList-r12	OPTIONAL, Need OR
commSyncConfig-r12	SL-SyncConfigList-r12	OPTIONAL Need OR
}		OPTIONAL, Need OR
lateNonCriticalExtension	OCTET STRING	OPTIONAL,
· · · · <i>,</i>		
[[commTxPoolNormalCommonExt-r13	SL-CommTxPoolListExt-r13	OPTIONAL, Need OR
commTxResourceUC-ReqAllowed-r13	ENUMERATED {true}	OPTIONAL, Need OR
commTxAllowRelayCommon-r13	ENUMERATED {true}	OPTIONAL Need OR
]]		
}		

SystemInformationBlockType18 field descriptions		
commRxPool		
Indicates the resources by which the UE is allowed to receive sidelink communication while in RRC_IDLE and while in		
RRC_CONNECTED.		
commSyncConfig		
Indicates the configuration by which the UE is allowed to receive and transmit synchronisation information. E-UTRAN		
configures commSyncConfig including txParameters when configuring UEs by dedicated signalling to transmit		
synchronisation information.		
commTxAllowRelayCommon		
Indicates whether the UE is allowed to transmit relay related sidelink communication data using the transmission pools		
included in SystemInformationBlockType18 i.e. either via commTxPoolNormalCommon,		
commTxPoolNormalCommonExt or via commTxPoolExceptional.		
commTxPoolExceptional		
Indicates the resources by which the UE is allowed to transmit sidelink communication in exceptional conditions, as		
specified in 5.10.4.		
commTxPoolNormalCommon		
Indicates the resources by which the UE is allowed to transmit sidelink communication while in RRC_IDLE or when in		
RRC_CONNECTED while transmitting sidelink via a frequency other than the primary.		
commTxPoolNormalCommonExt		
Indicates transmission resource pool(s) in addition to the pool(s) indicated by field commTxPoolNormalCommon, by		
which the UE is allowed to transmit sidelink communication while in RRC_IDLE or when in RRC_CONNECTED while		
transmitting sidelink via a frequency other than the primary. E-UTRAN configures commTxPoolNormalCommonExt		
only when it configures commTxPoolNormalCommon.		
commTxResourceUC-ReqAllowed		
Indicates whether the UE is allowed to request transmission pools for non-relay related one-to-one sidelink		
communication.		

_

SystemInformationBlockType19

The IE *SystemInformationBlockType19* indicates E-UTRAN supports the sidelink UE information procedure and may contain sidelink discovery related resource configuration information.

SystemInformationBlockType19 information element

-- ASN1START

SystemInformationBlockType19-r12 ::= SE	QUENCE {	
discConfig-r12	SEQUENCE {	
discRxPool-r12	SL-DiscRxPoolList-r12,	
discTxPoolCommon-r12	SL-DiscTxPoolList-r12 OPTIONAL, Need OR	
discTxPowerInfo-r12	SL-DiscTxPowerInfoList-r12 OPTIONAL, Cond Tx	
discSyncConfig-r12	SL-SyncConfigList-r12 OPTIONAL Need OR	
}	OPTIONAL, Need OR	
discInterFreqList-r12	SL-CarrierFreqInfoList-r12 OPTIONAL, Need OR	
lateNonCriticalExtension	OCTET STRING OPTIONAL,	
••••		
[[discConfig-v1310	SEQUENCE {	
discInterFreqList-v1310	SL-CarrierFreqInfoList-v1310 OPTIONAL, Need OR	
gapRequestsAllowedCommon	ENUMERATED {true} OPTIONAL Need OR	
}	OPTIONAL, Need OR	
discConfigRelay-r13	SEQUENCE {	
relayUE-Config-r13	SL-DiscConfigRelayUE-r13,	
remoteUE-Config-r13	SL-DiscConfigRemoteUE-r13	
}	OPTIONAL, Need OR	
discConfigPS-13	SEQUENCE {	
discRxPoolPS-r13	SL-DiscRxPoolList-r12,	
discTxPoolPS-Common-r13	SL-DiscTxPoolList-r12 OPTIONAL Need OR	
}	OPTIONAL Need OR	
11		
}		
SL-CarrierFreqInfoList-r12 ::= SEQUENC	E (SIZE (1maxFreq)) OF SL-CarrierFreqInfo-r12	
SL-CarrierFreqInfoList-v1310 ::= SEQ	<pre>UENCE (SIZE (1maxFreq)) OF SL-CarrierFreqInfo-v1310</pre>	
SL-CarrierFreqInfo-r12::= SEQUENC		
	CN-ValueEUTRA-r9,	
plmn-IdentityList-r12 PLM	N-IdentityList4-r12 OPTIONAL Need OP	
}		
SL-DiscConfigRelayUE-r13 ::= SEQUENC		
SH-DISCOULIGREIAYUE-IIS ··= SEQUENC	£ь (

threshHigh-r13 RSRP-RangeSL4-r13 OPTIONAL, -- Need OR threshLow-r13 -- Need OR RSRP-RangeSL4-r13 OPTIONAL, hvstMax-r13 ENUMERATED {dB0, dB3, dB6, dB9, dB12, dBinf} OPTIONAL, -- Cond ThreshHigh hystMin-r13 ENUMERATED {dB0, dB3, dB6, dB9, dB12} OPTIONAL -- Cond ThreshLow } SL-DiscConfigRemoteUE-r13 := SEQUENCE { threshHigh-r13 RSRP-RangeSL4-r13 OPTIONAL, -- Need OR hystMax-r13 ENUMERATED {dB0, dB3, dB6, dB9, dB12} OPTIONAL, -- Cond ThreshHigh reselectionInfoIC-r13 ReselectionInfoRelay-r13 } ReselectionInfoRelay-r13 ::= SEQUENCE { q-RxLevMin-r13 Q-RxLevMin, -- Note that the mapping of invidual values may be different for PC5, but the granularity/ -- number of values is same as for Uu filterCoefficient-r13 FilterCoefficient, ENUMERATED {dB0, dB3, minHyst-r13 dB6, dB9, dB12, dBinf} OPTIONAL -- Need OR } SL-CarrierFreqInfo-v1310::= SEQUENCE { discResourcesNonPS-r13SL-ResourcesInterFreq-r13OPTIONAL, -- Need ORdiscResourcesPS-r13SL-ResourcesInterFreq-r13OPTIONAL, -- Need ORdiscConfigOther-r13SL-DiscConfigOtherInterFreq-r13OPTIONAL, -- Need OR . . . } PLMN-IdentityList4-r12 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo2-r12 PLMN-IdentityInfo2-r12 ::= CHOICE { plmn-Index-r12 plmnIdentity-r12 INTEGER (1..maxPLMN-r11), PLMN-Identity } SL-DiscTxResourcesInterFreq-r13 ::= CHOICE { acquireSI-FromCarrier-r13 NULL, discTxPoolCommon-r13 SL-DiscTxPoolList-r12, discTxPoolCommon-r13 requestDedicated-r13 NULL, noTxOnCarrier-r13 NULL } SL-DiscConfigOtherInterFreq-r13::= SEQUENCE { InstructionInstructionInstructionInstructionOPTIONAL,txPowerInfo-r13SL-DiscTxPowerInfoList-r12OPTIONAL,refCarrierCommon-r13ENUMERATED {pCell}OPTIONAL,discSyncConfig-r13SL-SyncConfigListNFreq-r13OPTIONAL,discCellSelectionInfo-r13CellSelectionInfoNFreq-r13OPTIONAL -- Cond Tx -- Need OR -- Need OR -- Need OR } SL-ResourcesInterFreq-r13 ::= SEQUENCE { -- Need OR discRxResourcesInterFreq-r13 SL-DiscRxPoolList-r12 OPTIONAL, discTxResourcesInterFreq-r13 SL-DiscTxResourcesInterFreq-r13 OPTIONAL -- Need OR }

SystemInformationBlockType19 field descriptions discCellSelectionInfo Parameters that may be used by the UE to select/ reselect a cell on the concerned non serving frequency. If absent, the UE acquires the information from the target cell on the concerned frequency. See TS 36.304 [4], clause 11.4. discInterFreaList Indicates the neighbouring frequencies on which sidelink discovery announcement is supported. May also provide further information i.e. reception resource pool and/ or transmission resource pool, or an indication how resources could be obtained. discRxPool Indicates the resources by which the UE is allowed to receive non-PS related sidelink discovery announcements while in RRC IDLE and while in RRC CONNECTED. discRxPoolPS Indicates the resources by which the UE is allowed to receive PS related sidelink discovery announcements while in RRC_IDLE and while in RRC_CONNECTED. discRxResourcesInterFreq Indicates the resource pool configuration for receiving discovery announcements on a carrier frequency. discSvncConfia Indicates the configuration by which the UE is allowed to receive and transmit synchronisation information. E-UTRAN configures discSyncConfig including txParameters when configuring UEs by dedicated signalling to transmit synchronisation information. discTxPoolCommon Indicates the resources by which the UE is allowed to transmit non-PS related sidelink discovery announcements while in RRC_IDLE. discTxPooIPS-Common Indicates the resources by which the UE is allowed to transmit PS related sidelink discovery announcements while in RRC_IDLE. discTxResourcesInterFreq For the concerned frequency, either provides the UE with a pool of sidelink discovery announcement transmission resources the UE is allowed to use while in RRC_IDLE, or indicates whether such transmission is allowed, and if so how the UE may obtain the required resources. Value *noTxOnCarrier* indicates that the UE is not allowed to transmit sidelink discovery announcements on the concerned frequency. Value acquireSI-FromCarrier indicates that the required resources are to be obtained by autonomously acquiring SIB19 and other relevant SIBs from the concerned frequency. Value requestDedicated indicates, that for the concerned carrier, the required sidelink discovery resources are to be obtained by means of a dedicated resource request using the SidelinkUEInformation message. plmn-IdentityList List of PLMN identities for the neighbouring frequency indicated by carrierFreq. Absence of the field indicates the same PLMN identities as listed across the plmn-IdentityList fields (without suffix) in SystemInformationBlockType1. plmn-Index Index of the corresponding entry across the plmn-IdentityList fields (without suffix) within SystemInformationBlockType1. refCarrierCommon Indicates if the PCell (RRC_CONNECTED)/ serving cell (RRC_IDLE) is to be used as reference for DL measurements and synchronization, instead of the DL frequency paired with the one used to transmit sidelink discovery announcements on, see TS 36.213 [23], clause 14.3.1. reselectionInfoIC Includes the parameters used by the UE when selecting/ reselecting a sidelink relay UE. SL-CarrierFreqInfoList-v1310 If included, the UE shall include the same number of entries, and listed in the same order, as in SL-CarrierFreqInfoList-r12. threshHigh, threshLow (relayUE) Indicates when a sidelink remote UE or sidelink relay UE that is in network coverage may use the broadcast PS related sidelink discovery Tx resource pool, if broadcast, or request Tx resources by dedicated signalling otherwise. For remote UEs, this parameter is used similarly for relay related sidelink communication.

Conditional presence	Explanation
ThreshHigh	The field is mandatory present if <i>threshHigh</i> is included in the corresponding IE.
-	Otherwise the field is not present and UE shall delete any existing value for this field.
ThreshLow	The field is mandatory present if <i>threshLow</i> is included. Otherwise the field is not present
	UE shall delete any existing value for this field.
Тх	The field is mandatory present if <i>discTxPoolCommon</i> is included. Otherwise the field is
	optional present, need OR.

-- ASN1START

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SystemInformationBlockType20

The IE SystemInformationBlockType20 contains the information required to acquire the control information associated transmission of MBMS using SC-PTM.

SystemInformationBlockType20 information element

```
SystemInformationBlockType20-r13 ::= SEQUENCE {
    sc-mcch-RepetitionPeriod-r13
                                         ENUMERATED {rf2, rf4, rf8, rf16, rf32, rf64, rf128, rf256},
    sc-mcch-Repetition == INTEGER (0..10,,
sc-mcch-Difset-r13 INTEGER (0..9),
sc-mcch-FirstSubframe-r13 INTEGER (0..9),
INTEGER (2..9) OPTIONAL,
    sc-mcch-ModificationPeriod-r13 ENUMERATED {rf2, rf4, rf8, rf16, rf32, rf64, rf128, rf256,
                                         rf512, rf1024, r2048, rf4096, rf8192, rf16384, rf32768,
                                          rf65536},
    lateNonCriticalExtension
                                         OCTET STRING
                                                                               OPTIONAL,
    [[ br-BCCH-Config-r14
                                             SEQUENCE {
            dummy
                                                 ENUMERATED {rf1},
            dummy2
                                                  ENUMERATED {rf1},
            mpdcch-Narrowband-SC-MCCH-r14
                                                 INTEGER (1...maxAvailNarrowBands-r13),
            mpdcch-NumRepetition-SC-MCCH-r14 ENUMERATED {r1, r2, r4, r8, r16,
                                                              r32, r64, r128, r256},
            mpdcch-StartSF-SC-MCCH-r14
                                                  CHOICE {
                fdd-r14
                                                      ENUMERATED {v1, v1dot5, v2, v2dot5, v4,
                                                                   v5, v8, v10},
                tdd-r14
                                                      ENUMERATED {v1, v2, v4, v5, v8, v10, v20}
            },
            mpdcch-PDSCH-HoppingConfig-SC-MCCH-r14 ENUMERATED {off, ce-ModeA, ce-ModeB},
            sc-mcch-CarrierFreq-r14 ARFCN-ValueEUTRA-r9,
            sc-mcch-Offset-BR-r14
                                                  INTEGER (0..10),
            sc-mcch-RepetitionPeriod-BR-r14 ENUMERATED {rf32, rf128, rf512, rf1024,
                                                      rf2048, rf4096, rf8192, rf16384},
            sc-mcch-ModificationPeriod-BR-r14 ENUMERATED { rf32, rf128, rf256, rf512, rf1024,
                                                      rf2048, rf4096, rf8192, rf16384, rf32768,
                                                      rf65536, rf131072, rf262144, rf524288,
                                                      rf1048576}
                                                                               OPTIONAL,
                                                                                            -- Need OR
                                             SC-MCCH-SchedulingInfo-r14
                                                                                           -- Need OP
        sc-mcch-SchedulingInfo-r14
                                                                               OPTIONAL,
        {\tt pdsch-maxNumRepetitionCEmodeA-SC-MTCH-r14}
                                              ENUMERATED { r16, r32 } OPTIONAL, -- Need OR
        pdsch-maxNumRepetitionCEmodeB-SC-MTCH-r14
                                              ENUMERATED {
                                                 r192, r256, r384, r512, r768, r1024,
                                                  r1536, r2048}
                                                                               OPTIONAL
                                                                                            -- Need OR
    ]],
    [[ sc-mcch-RepetitionPeriod-v1470
                                             ENUMERATED {rf1}
                                                                               OPTIONAL, -- Need OR
        sc-mcch-ModificationPeriod-v1470
                                             ENUMERATED {rf1}
                                                                               OPTTONAL
                                                                                            -- Need OR
    11
}
SC-MCCH-SchedulingInfo-r14::= SEQUENCE
                                            {
                                         ENUMERATED {psf10, psf20, psf100, psf300,
    onDurationTimerSCPTM-r14
                                                  psf500, psf1000, psf1200, psf1600},
                                         ENUMERATED {psf0, psf1, psf2, psf4, psf8, psf16,
    drx-InactivityTimerSCPTM-r14
                                                 psf32, psf64, psf128, psf256, ps512,
psf1024, psf2048, psf4096, psf8192, psf16384},
    schedulingPeriodStartOffsetSCPTM-r14
                                             CHOICE {
                                                  INTEGER(0..9),
        sf10
        sf20
                                                  INTEGER(0..19),
        sf32
                                                  INTEGER(0..31),
        sf40
                                                  INTEGER(0..39),
        sf64
                                                  INTEGER(0..63),
        sf80
                                                  INTEGER(0..79),
                                                  INTEGER(0..127),
        sf128
        sf160
                                                  INTEGER(0..159),
        sf256
                                                  INTEGER(0..255),
        sf320
                                                  INTEGER(0..319),
        sf512
                                                  INTEGER(0..511),
        sf640
                                                  INTEGER(0..639),
        sf1024
                                                  INTEGER(0..1023),
        sf2048
                                                  INTEGER(0..2047),
        sf4096
                                                  INTEGER(0..4095),
                                                  INTEGER(0..8191)
        sf8192
   },
```

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} ...

SystemInformationBlockType20 field descriptions	
pr-BCCH-Config-r14	
The field is present if SystemInformationBlockType20 is sent on BR-BCCH. Otherwise the field is absent. Jummy	
This field is not used in the specification. If received it shall be ignored by the UE.	
imer for listening to SC-MCCH scheduling in TS 36.321 [6]. Value in number of MPDCCH sub-frames. Valu	le nsf∩
orresponds to 0 MPDCCH sub-frame, psf1 corresponds to 1 MPDCCH sub-frame and so on.	ic p310
npdcch-Narrowband-SC-MCCH	
arrowband for MPDCCH for SC-MCCH, see TS 36.213 [23].	
npdcch-NumRepetitions-SC-MCCH	
The maximum number of MPDCCH repetitions the UE needs to monitor for SC-MCCH, see TS 36.213 [23].	
npdcch-StartSF-SC-MCCH	
Configuration of the starting subframes of the MPDCCH search space for SC-MCCH, see TS 36.213 [23]. npdcch-PDSCH-HoppingConfig-SC-MCCH	
requency hopping configuration for MPDCCH/PDSCH for SC-MCCH, see TS 36.213 [23].	
ndicates the duration in subframes during which SC-MCCH may be scheduled in MPDCCH sub-frames, sector (6.321 [6].	e TS
odsch-maxNumRepetitionCEmodeA-SC-MTCH	
Aximum value to indicate the set of PDSCH repetition numbers for SC-MTCH to UEs in CE mode A, see T 23].	S 36.213
odsch-maxNumRepetitionCEmodeB-SC-MTCH	
Anximum value to indicate the set of PDSCH repetition numbers for SC-MTCH CE to UEs in mode B, see T 23].	S 36.213
chedulingPeriodStartOffsetSCPTM	
SCPTM-SchedulingCycle and SCPTM-SchedulingOffset in TS 36.321 [6]. The value of SCPTM-Scheduling	<i>Cycle</i> is in
number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so alue of SCPTM-SchedulingOffset is in number of sub-frames.	on. The
c-mcch-CarrierFreq	
Downlink carrier used for all multicast SC-MCCH transmissions.	
c-mcch-duration	
ndicates, starting from the subframe indicated by sc-mcch-FirstSubframe, the duration in subframes during	
ICCH may be scheduled in PDCCH sub-frames, see TS 36.321 [6]. Absence of this IE means that SC-MC	CH is only
cheduled in the subframe indicated by sc-mcch-FirstSubframe.	
s c-mcch-ModificationPeriod	I = 0 The
Defines periodically appearing boundaries, i.e. radio frames for which SFN mod <i>sc-mcch-ModificationPerioc</i> contents of different transmissions of SC-MCCH information can only be different if there is at least one sucl	
oundary in-between them. Value rf2 corresponds to 2 radio frames, value rf4 corresponds to 4 radio frames	
n. In case sc-mcch-ModificationPeriod-v1470 is configured, the UE shall ignore the configuration of sc-mcc	
Adification Period-r13.	
c-mcch-ModificationPeriod-BR	
Defines periodically appearing boundaries for BL UE or UE in CE, i.e. radio frames for which (H-SFN*1024 -	⊦ SFN)
nod sc-mcch-ModificationPeriod-BR = 0 if hyperSFN is present in SystemInformationBlockType1-BR or rad	
or which SFN mod sc-mcchModificationPeriod-BR = 0 otherwise. The contents of different transmissions of	
nformation can only be different if there is at least one such boundary in-between them. Value rf32 corresponde	onds to 32
adio frames, value rf128 corresponds to 128 radio frames and so on.	
c-mcch-FirstSubframe	
ndicates the first subframe in which SC-MCCH is scheduled	
c-mcch-Offset	80
ndicates, together with the <i>sc-mcch-RepetitionPeriod</i> , the radio frames in which SC-MCCH is scheduled i.e <i>I</i> CCH is scheduled in radio frames for which: SFN mod sc- <i>mcch-RepetitionPeriod</i> = <i>sc-mcch-Offset</i> .	. 30-
c-mcch-Offset-BR	
ndicates, together with the <i>sc-mcch-RepetitionPeriod-BR</i> , the boundary of the SC-MCCH repetition period f	or BL UF
r UE in CE: (H-SFN*1024 + SFN) mod <i>sc-mcch-RepetitionPeriod-BR</i> = <i>sc-mcch-Offset-BR</i> if hyperSFN is	
SystemInformationBlockType1-BR or radio frames for which (SFN mod mod sc-mcch-RepetitionPeriod-BR)	
ncch-Offset-BR otherwise.	
c-mcch-RepetitionPeriod	
Defines the interval between transmissions of SC-MCCH information, in radio frames. Value rf2 corresponds	
rames, rf4 corresponds to 4 radio frames and so on. In case sc-mcch-RepetitionPeriod-v1470 is configured	, the UE
hall ignore the configuration of sc-mcch-RepetitionPeriod-r13.	
sc-mcch-RepetitionPeriod-BR	\/.·!
Defines the interval between transmissions of SC-MCCH information for BL UE or UE in CE, in radio frames	. Value
i32 corresponds to 32 radio frames, rf128 corresponds to 128 radio frames and so on.	

SystemInformationBlockType21

The IE SystemInformationBlockType21 contains V2X sidelink communication configuration.

SystemInformationBlockType21 information element

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-- ASN1START
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<pre>SystemInformationBlockType21-r14 ::= sl-V2X-ConfigCommon-r14 lateNonCriticalExtension }</pre>	SEQUENCE { SL-V2X-ConfigCommon-r14 OCTET STRING	OPTIONAL, OPTIONAL,	Need OR
SL-V2X-ConfigCommon-r14 ::= SEQUE	NCE {		
v2x-CommRxPool-r14	SL-CommRxPoolListV2X-r14	OPTIONAL,	Need OR
v2x-CommTxPoolNormalCommon-r14	SL-CommTxPoolListV2X-r14	OPTIONAL,	Need OR
p2x-CommTxPoolNormalCommon-r14	SL-CommTxPoolListV2X-r14	OPTIONAL,	Need OR
v2x-CommTxPoolExceptional-r14	SL-CommResourcePoolV2X-r14	OPTIONAL,	Need OR
v2x-SyncConfig-r14	SL-SyncConfigListV2X-r14	OPTIONAL,	Need OR
v2x-InterFreqInfoList-r14	SL-InterFreqInfoListV2X-r14	OPTIONAL,	Need OR
v2x-ResourceSelectionConfig-r14	SL-CommTxPoolSensingConfig-r14	OPTIONAL,	Need OR
zoneConfig-r14	SL-ZoneConfig-r14	OPTIONAL,	Need OR
typeTxSync-r14	SL-TypeTxSync-r14	OPTIONAL,	Need OR
thresSL-TxPrioritization-r14	SL-Priority-r13	OPTIONAL,	Need OR
anchorCarrierFreqList-r14	SL-AnchorCarrierFreqList-V2X-r14	OPTIONAL,	Need OR
offsetDFN-r14	INTEGER (01000)	OPTIONAL,	Need OR
cbr-CommonTxConfigList-r14	SL-CBR-CommonTxConfigList-r14	OPTIONAL	Need OR
}			

SystemInformationBlockType21 field descriptions	
anchorCarrierFreqList	
ndicates carrier frequencies which may include inter-carrier resource configuration for V2X sidelink communica	ation.
cbr-CommonTxConfigList	
ndicates the common list of CBR ranges and the list of PSSCH transmissions parameter configurations availab	ole to
configure congestion control to the UE for V2X sidelink communication.	
offsetDFN	
ndicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference for the F	PCell.
Value 0 corresponds to 0 milliseconds, value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002	2
nilliseconds, and so on.	
p2x-CommTxPoolNormalCommon	
ndicates the resources by which the UE is allowed to transmit P2X related V2X sidelink communication. zoneIL	D is no
configured in the pools in this field.	
thresSL-TxPrioritization	
ndicates the threshold used to determine whether SL V2X transmission is prioritized over uplink transmission if	f they
overlap in time (see TS 36.321 [6]). This value shall overwrite thresSL-TxPrioritization configured in SL-V2X-	
Preconfiguration if any.	
typeTxSync	
ndicates the prioritized synchronization type (i.e. eNB or GNSS) for performing V2X sidelink communication on	the
carrier frequency on which this field is broadcast.	
v2x-CommRxPool	
ndicates the resources by which the UE is allowed to receive V2X sidelink communication while in RRC_IDLE	and in
RRC_CONNECTED.	
v2x-CommTxPoolExceptional	
ndicates the resources by which the UE is allowed to transmit V2X sidelink communication in exceptional cond	litions,
as specified in 5.10.13.	
v2x-CommTxPoolNormalCommon	
ndicates the resources by which the UE is allowed to transmit non-P2X related V2X sidelink communication whether	
RRC_IDLE or when in RRC_CONNECTED while transmitting V2X sidelink communication via a frequency othe	er than
he primary. E-UTRAN configures one resource pool per zone.	
v2x-InterFreqInfoList	
ndicates synchronization and resource allocation configurations of neighboring frequencies for V2X sidelink	
communication.	
v2x-ResourceSelectionConfig	
ndicates V2X sidelink communication configurations used for UE autonomous resource selection.	
v2x-SyncConfig	
ndicates the configuration by which the UE is allowed to receive and transmit synchronisation information for V	
sidelink communication. E-UTRAN configures v2x-SyncConfig including txParameters when configuring UEs to)
ransmit synchronisation information.	
zoneConfig	
ndicates zone configurations used for V2X sidelink communication in 5.10.13.2.	

_

SystemInformationBlockType24

The IE *SystemInformationBlockType24* contains information relevant only for inter-RAT cell re-selection i.e. information about NR frequencies and NR neighbouring cells relevant for cell re-selection. The IE includes cell reselection parameters common for a frequency.

SystemInformationBlockType24 information element

ASN1START			
SystemInformationBlockType24-r15 ::	= SEQUENCE {		
	~ (ODELONAL	N
carrierFreqListNR-r15	CarrierFreqListNR-r15	OPTIONAL,	Need
OR			
t-ReselectionNR-r15	T-Reselection,		
t-ReselectionNR-SF-r15	SpeedStateScaleFactors	OPTIONAL,	Need OR
lateNonCriticalExtension	OCTET STRING	,	need on
TateMonCriticalExtension	OCIEI SIRING	OPTIONAL,	
}			
•			
CarrierFreqListNR-r15 ::= SEO	UENCE (SIZE (1maxFreg)) OF Carrie	rFreqNP_r15	
Callielliequiscant its SEQ	UENCE (SIZE (IMaxFIEQ/) OF Callie	TTTTEQUICTT5	
CarrierFreqNR-r15 ::=	SEQUENCE {		
carrierFreq-r15	ARFCN-ValueNR-r15,		
multiBandInfoList-r15	MultiFrequencyBandListNR-r15	OPTIONAL,	Need OR
multiBandInfoListSUL-r15	MultiFrequencyBandListNR-r15	OPTIONAL,	Need OR
measTimingConfig-r15	MTC-SSB-NR-r15	OPTIONAL,	Need OR

subcarrierSpacingSSB-r15	ENUMERATED {kHz15, kHz30, kHz12	0, kHz240},
ss-RSSI-Measurement-r15	SS-RSSI-Measurement-r15 OPT	IONAL, Cond RSRQ2
cellReselectionPriority-r15	CellReselectionPriority OPT	IONAL, Need OP
cellReselectionSubPriority-r15	CellReselectionSubPriority-r13	OPTIONAL, Need OR
threshX-High-r15	ReselectionThreshold,	
threshX-Low-r15	ReselectionThreshold,	
threshX-Q-r15	SEQUENCE {	
threshX-HighQ-r15	ReselectionThresholdQ-r9,	
threshX-LowQ-r15	ReselectionThresholdQ-r9	
}		OPTIONAL, Cond RSRQ
q-RxLevMin-r15	INTEGER (-7022),	
q-RxLevMinSUL-r15	INTEGER (-7022)	OPTIONAL, Need OR
p-MaxNR-r15	P-MaxNR-r15,	
ns-PmaxListNR-r15	NS-PmaxListNR-r15	OPTIONAL, Need OR
q-QualMin-r15	INTEGER (-4312)	OPTIONAL, Need OP
deriveSSB-IndexFromCell-r15	BOOLEAN,	
maxRS-IndexCellQual-r15	MaxRS-IndexCellQualNR-r15	OPTIONAL, Need OR
threshRS-Index-r15	ThresholdListNR-r15	OPTIONAL, Need OR
• • • • •		
[[multiBandNsPmaxListNR-v1550	MultiBandNsPmaxListNR-1-v1550	OPTIONAL, Need OR
multiBandNsPmaxListNR-SUL-v1550	MultiBandNsPmaxListNR-v1550	OPTIONAL, Need OR
ssb-ToMeasure-r15	SSB-ToMeasure-r15	OPTIONAL Need OR
]]		
}		
MultiBandNsPmaxListNR-1-v1550 ::= SEQ	UENCE (SIZE (1 maxMultiBandsNR	-1-r15)) OF NS-PmaxListNR-r15

MultiBandNsPmaxListNR-v1550 ::= SEQUENCE (SIZE (1.. maxMultiBandsNR-r15)) OF NS-PmaxListNR-r15

Conditional presence	Explanation
RSRQ	The field is mandatory present if the <i>threshServingLowQ</i> is present in
	systemInformationBlockType3; otherwise it is not present.
RSRQ2	The field is optional Need OP if the <i>threshServingLowQ</i> is present in systemInformationBlockType3; otherwise it is not present.

SystemInformationBlockType25

The IE SystemInformationBlockType25 contains the UAC parameters.

SystemInformationBlockType25 information element

```
-- ASN1START
SystemInformationBlockType25-r15 ::= SEQUENCE {
   uac-BarringForCommon-r15
                                            UAC-BarringPerCatList-r15
                                                                                     OPTIONAL,
Need OP
    uac-BarringPerPLMN-List-r15
                                      UAC-BarringPerPLMN-List-r15
                                                                                OPTIONAL, -- Need
OP
   uac-BarringInfoSetList-r15
                                        UAC-BarringInfoSetList-r15,
   uac-BarringInfoSetList-r15 UAC-Barri
uac-ACl-SelectAssistInfo-r15 CHOICE {
       plmnCommon-r15
                                                 UAC-AC1-SelectAssistInfo-r15,
        individualPLMNList-r15 SEQUENCE (SIZE (2..maxPLMN-r11)) OF UAC-AC1-SelectAssistInfo-r15
                   OPTIONAL, -- Need OR
    lateNonCriticalExtension
                                            OCTET STRING
                                                                                         OPTIONAL,
}
UAC-BarringPerPLMN-List-r15::= SEQUENCE (SIZE (1.. maxPLMN-r11)) OF UAC-BarringPerPLMN-r15
UAC-BarringPerPLMN-r15 ::= SEQUENCE {
   plmn-IdentityIndex-r15 INTEGER (1.. maxPLMN-r11),
uac-AC-BarringListType-r15 CHOICE{
   plmn-IdentityIndex-r15
       uac-ImplicitAC-BarringList-r15
                                            SEQUENCE (SIZE(maxAccessCat-1-r15)) OF UAC-
BarringInfoSetIndex-r15,
       uac-ExplicitAC-BarringList-r15
                                            UAC-BarringPerCatList-r15
                           OPTIONAL
                                        -- Need OR
}
UAC-BarringPerCatList-r15 ::= SEQUENCE (SIZE (1..maxAccessCat-1-r15)) OF UAC-BarringPerCat-r15
UAC-BarringPerCat-r15 ::= SEQUENCE {
   accessCategory-r15
                                        INTEGER (1..maxAccessCat-1-r15),
    uac-barringInfoSetIndex-r15 UAC-BarringInfoSetIndex-r15
}
UAC-BarringInfoSetIndex-r15 ::= INTEGER (1..maxBarringInfoSet-r15)
UAC-BarringInfoSetList-r15 ::=
                                   SEQUENCE (SIZE (1..maxBarringInfoSet-r15)) OF UAC-BarringInfoSet-
r15
UAC-BarringInfoSet-r15 ::= SEQUENCE {
   uac-BarringFactor-r15
                             ENUMERATED {
                                    p00, p05, p10, p15, p20, p25, p30, p40,
                                    p50, p60, p70, p75, p80, p85, p90, p95},
   uac-BarringTime-r15
                               ENUMERATED {s4, s8, s16, s32, s64, s128, s256, s512},
                                                BIT STRING (SIZE(7))
    uac-BarringForAccessIdentity-r15
}
UAC-AC1-SelectAssistInfo-r15::= ENUMERATED {a, b, c}
-- ASN1STOP
```

SystemInformationBlockType25 field descriptions	
accessCategory	
The Access Category according to TS 22.261 [96].	
uac-AC-BarringListType	
Access control parameters for each access category valid only for a specific PLMN. UE behaviour upon abse	nce of
this field is specified in clause 5.3.16.2.	
uac-AC1-SelectAssistInfo	
Information used to determine whether Access Category 1 applies to the UE, as defined in TS 22.261 [96]. The	ne field is
forwarded to upper layers, if present.	
uac-BarringFactor	
Represents the probability that access attempt would be allowed during access barring check.	
uac-BarringForAccessIdentity	
Indicates whether access attempt is allowed for each Access Identity. The leftmost bit, bit 0 in the bit string	
corresponds to Access Identity 1, bit 1 in the bit string corresponds to Access Identity 2, bit 2 in the bit string	
corresponds to Access Identity 11, bit 3 in the bit string corresponds to Access Identity 12 and so on. Value 0	means
that access attempt is allowed for the corresponding access identity.	
uac-BarringForCommon	
Common access control parameters for each access category. Common values are used for all PLMNs, unler overwritten by the PLMN specific configuration provided in <i>uac-BarringPerPLMN-List</i> . The parameters are specific	
providing an index to the set of configurations (uac-BarringInfoSetList). UE behaviour upon absence of this fie	eld is
specified in clause 5.3.16.2.	
uac-barringInfoSetIndex	
Index of the entry in field uac-BarringInfoSetList. Value 1 corresponds to the first entry in uac-BarringInfoSetL	
2 corresponds to the second entry in this list and so on. An index value referring to an entry not included in ua	1 C-
BarringInfoSetList indicates no barring.	
uac-BarringInfoSetList	
List of access control parameter sets. Each access category can be configured with access parameters corre	sponding
to a particular set by uac-barringInfoSetIndex. Association of an access category with an index that has no	
corresponding entry in the uac-BarringInfoSetList is valid configuration and indicates no barring.	
uac-BarringPerPLMN-List	
Access control parameters for each access category valid only for a specific PLMN.	
uac-BarringTime	
The minimum time before a new access attempt is to be performed after an access attempt was barred at acc	cess
barring check for the same access category.	

SystemInformationBlockType26

The IE SystemInformationBlockType26 contains V2X sidelink communication configurations which can be used jointly with those included in SystemInformationBlockType21.

SystemInformationBlockType26 information element

ASN1START			
SystemInformationBlockType26-r15 ::= S	EQUENCE {		
v2x-InterFreqInfoList-r15	SL-InterFreqInfoListV2X-r14	OPTIONAL,	Need OR
cbr-pssch-TxConfigList-r15	SL-CBR-PPPP-TxConfigList-r15	OPTIONAL,	Need OR
v2x-PacketDuplicationConfig-r15	SL-V2X-PacketDuplicationConfig-r15	OPTIONAL,	Need OR
syncFreqList-r15	SL-V2X-SyncFreqList-r15	OPTIONAL,	Need OR
slss-TxMultiFreq-r15	ENUMERATED{true}	OPTIONAL,	Need OR
v2x-FreqSelectionConfigList-r15	SL-V2X-FreqSelectionConfigList-r15	OPTIONAL,	Need OR
threshS-RSSI-CBR-r14	INTEGER (045)	OPTIONAL,	Need OR
}			

_

SystemInformationBlockType26 field descriptions

cbr-pssch-TxConfigList

Indicates the mapping between PPPPs, CBR ranges by using indexes of the entry in *cbr-RangeCommonConfigList* included in SIB21, and PSSCH transmission parameters and CR limit by using indexes of the entry in *sI-CBR-PSSCH-TxConfigList* included in SIB21. The configurations in this field apply to all the resource pools on all the carrier frequencies included in SIB26 for V2X sidelink communication transmission. The *mcs-PSSCH-RangeList-r15* included in this field also applies to all the resource pools on all the carrier frequencies included in SIB21 for V2X sidelink communication transmission.

slss-TxMultiFreq

Value TRUE indicates the UE transmits SLSS on multiple carrier frequencies for V2X sidelink communication. If this field is absent, the UE transmits SLSS only on the synchronisation carrier frequency.

syncFreqList

Indicates a list of candidate carrier frequencies that can be used for the synchronisation of V2X sidelink communication.

threshS-RSSI-CBR

Indicates the S-RSSI threshold for determining the contribution of a sub-channel to the CBR measurement, as specified in TS 36.214 [48]. Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n*2) dBm, and so on. If included, the *threshS-RSSI-CBR* in *SL-CommResourcePoolV2X* in SIB26 is absent.

v2x-FreqSelectionConfigList

Indicates the configuration information for the carrier selection for V2X sidelink communication transmission on the carrier frequency where the field is broadcast.

v2x-PacketDuplicationConfig

Indicates the configuration information for sidelink packet duplication for V2X sidelink communication.

v2x-InterFreqInfoList

If this field includes a carrier frequency which is included in SIB21 and some configuration(s) for that carrier are already included in SIB21, the corresponding configuration(s) for that carrier frequency are not included in this field.

6.3.2 Radio resource control information elements

Antennalnfo

The IE AntennaInfoCommon and the AntennaInfoDedicated are used to specify the common and the UE specific antenna configuration respectively.

Antennalnfo information elements

```
-- ASN1START
AntennaInfoCommon ::=
                                  SEQUENCE {
                                      ENUMERATED {an1, an2, an4, spare1}
   antennaPortsCount
}
AntennaInfoDedicated ::=
                                 SEQUENCE {
                                     ENUMERATED {
   transmissionMode
                                          tml, tm2, tm3, tm4, tm5, tm6,
                                          tm7, tm8-v920},
   codebookSubsetRestriction
                                      CHOICE {
       n2TxAntenna-tm3
                                          BIT STRING (SIZE (2)),
                                          BIT STRING (SIZE (4)),
       n4TxAntenna-tm3
       n2TxAntenna-tm4
                                          BIT STRING (SIZE (6)),
       n4TxAntenna-tm4
                                          BIT STRING (SIZE (64)).
       n2TxAntenna-tm5
                                         BIT STRING (SIZE (4)),
                                          BIT STRING (SIZE (16)),
       n4TxAntenna-tm5
       n2TxAntenna-tm6
                                          BIT STRING (SIZE (4)),
                                         BIT STRING (SIZE (16))
       n4TxAntenna-tm6
          OPTIONAL,
                                                                              -- Cond TM
    }
   ue-TransmitAntennaSelection CHOICE{
           release
                                          NULL.
                                          ENUMERATED {closedLoop, openLoop}
           setup
   }
}
AntennaInfoDedicated-v920 ::=
                                  SEOUENCE {
   codebookSubsetRestriction-v920
                                   CHOICE {
      n2TxAntenna-tm8-r9
                                         BIT STRING (SIZE (6)),
       n4TxAntenna-tm8-r9
                                          BIT STRING (SIZE (32))
   }
           OPTIONAL
                                                                             -- Cond TM8
}
```

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AntennaInfoDedicated-r10 ::= SEQUENCE { transmissionMode-r10 ENUMERATED { tm1, tm2, tm3, tm4, tm5, tm6, tm7, tm8-v920, tm9-v1020, tm10-v1130, spare6, spare5, spare4, spare3, spare2, spare1}, codebookSubsetRestriction-r10 BIT STRING OPTIONAL. -- Cond TMX ue-TransmitAntennaSelection CHOICE { release NULL setup ENUMERATED {closedLoop, openLoop} } } AntennaInfoDedicated-v10i0::= SEQUENCE { ENUMERATED {twoLayers, fourLayers, eightLayers} OPTIONAL maxLayersMIMO-r10 ___ Need OR } AntennaInfoDedicated-v1250 ::= SEQUENCE { alternativeCodebookEnabledFor4TX-r12 BOOLEAN } AntennaInfoDedicated-v1430 ::= SEQUENCE { ce-UE-TxAntennaSelection-config-r14 ENUMERATED {on} OPTIONAL -- Need OR } AntennaInfoDedicatedSTTI-r15 ::= CHOICE { release NULL, SEQUENCE { setup transmissionModeDL-MBSFN-r15 ENUMERATED {tm9, tm10} OPTIONAL, -- Need OR ENUMERATED {tml, tm2, tm3, tm4, tm6, tm8, tm9, transmissionModeDL-nonMBSFN-r15 tm10} OPTIONAL, --_Need OR codebookSubsetRestriction CHOICE { n2TxAntenna-tm3-r15 BIT STRING (SIZE (2)), BIT STRING (SIZE (4)), n4TxAntenna-tm3-r15 n2TxAntenna-tm4-r15 BIT STRING (SIZE (6)), n4TxAntenna-tm4-r15 BIT STRING (SIZE (64)), n2TxAntenna-tm5-r15 BIT STRING (SIZE (4)), BIT STRING (SIZE (16)), n4TxAntenna-tm5-r15 BIT STRING (SIZE (4)), n2TxAntenna-tm6-r15 n4TxAntenna-tm6-r15 BIT STRING (SIZE (16)), n2TxAntenna-tm8-r15 BIT STRING (SIZE (6)), BIT STRING (SIZE (64)), n4TxAntenna-tm8-r15 BIT STRING (SIZE (6)), BIT STRING (SIZE (6)), BIT STRING (SIZE (96)), n2TxAntenna-tm9and10-r15 n4TxAntenna-tm9and10-r15 n8TxAntenna-tm9and10-r15 BIT STRING (SIZE (109)) } OPTIONAL, -- Cond TM ENUMERATED {twoLayers, fourLayers} OPTIONAL, -- Need OR maxLaversMIMO-STTI-r15 slotSubslotPDSCH-TxDiv-2Layer-r15 BOOLEAN, slotSubslotPDSCH-TxDiv-4Layer-r15 BOOLEAN } } AntennaInfoDedicated-v1530 ::= CHOICE { NULL, release CHOICE { setup ue-TxAntennaSelection-SRS-1T4R-Config-r15 NULL, ue-TxAntennaSelection-SRS-2T4R-NrOfPairs-r15 ENUMERATED {two, three} } }

-- ASN1STOP

ETSI

Antennalnfo field descriptions alternativeCodebookEnabledFor4TX Indicates whether code book in TS 36.213 [23] Table 7.2.4-0A to Table 7.2.4-0D is being used for deriving CSI feedback and reporting. E-UTRAN only configures the field if the UE is configured with a) tm8 with 4 CRS ports, tm9 or tm10 with 4 CSI-RS ports and b) PMI/RI reporting. antennaPortsCount Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1. ce-ue-TxAntennaSelection-config
feedback and reporting. E-UTRAN only configures the field if the UE is configured with a) <i>tm8</i> with 4 CRS ports, <i>tm9</i> or <i>tm10</i> with 4 CSI-RS ports and b) PMI/RI reporting. antennaPortsCount Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1.
feedback and reporting. E-UTRAN only configures the field if the UE is configured with a) <i>tm8</i> with 4 CRS ports, <i>tm9</i> or <i>tm10</i> with 4 CSI-RS ports and b) PMI/RI reporting. antennaPortsCount Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1.
or <i>tm10</i> with 4 CSI-RS ports and b) PMI/RI reporting. antennaPortsCount Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1.
antennaPortsCount Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1.
Parameter represents the number of cell specific antenna ports where an1 corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.2.1.
etc. see TS 36.211 [21], clause 6.2.1.
ce-ue-TxAntennaSelection-config
Configuration of UL closed-loop transmit antenna selection for non-BL UE in CE Mode A, see TS 36.212 [22].
codebookSubsetRestriction
Parameter: codebookSubsetRestriction, see TS 36.213 [23], clause 7.2 and TS 36.211 [21], clause 6.3.4.2.3. The
number of bits in the codebookSubsetRestriction for applicable transmission modes is defined in TS 36.213 [23],
Table 7.2-1b. If the UE is configured with transmissionMode tm8, E-UTRAN configures the field
codebookSubsetRestriction if PMI/RI reporting is configured. If the UE is configured with transmissionMode tm9, E-
UTRAN configures the field <i>codebookSubsetRestriction</i> if PMI/RI reporting is configured and if the number of CSI-RS
ports is greater than 1. E-UTRAN does not configure the field <i>codebookSubsetRestriction</i> in other cases where the UE
is configured with <i>transmissionMode</i> tm8 or tm9. Furthermore, E-UTRAN does not configure the field
codebookSubsetRestriction if the UE is configured with eMIMO-Type unless it is set to beamformed,
alternativeCodebookEnabledBeamformed is set to FALSE and csi-RS-ConfigNZPIdListExt is not configured.
maxLayersMIMO
Indicates the maximum number of layers for spatial multiplexing used to determine the rank indication bit width and Kc
determination of the soft buffer size for the corresponding serving cell according to TS 36.212 [22]. EUTRAN
configures this field only when <i>transmissionMode</i> is set to <i>tm3, tm4, tm9</i> or <i>tm10</i> for the corresponding serving cell.
When configuring the field for a serving cell which <i>transmissionMode</i> is set to <i>tm</i> 3 or <i>tm</i> 4, EUTRAN only configures
value fourLayers: For a serving cell which transmissionMode is set to tm9 or tm10, EUTRAN only configures the field
only if intraBandContiguousCC-InfoList or FeatureSetDL-PerCC is indicated for the band and the band combination of
the corresponding serving cell or the UE supports maxLayersMIMO-Indication.
maxLayersMIMO-STTI
Indicates the maximum number of layers, for each serving cell, to be used when determining if the shifted DMRS
pattern is applicable TS 36.211 [21], clause 6.10.3.2.
slotSubslotPDSCH-TxDiv-2Layer, slotSubslotPDSCH-TxDiv-4Layer
Indicates the table to be used in case of dynamic TX diversity fallback for TM9 and 10 for up to 2-layer/4-layer slot or
subslot PDSCH operation, see TS 36.212 [22], clause 5.3.3.1.22.
transmissionMode
Points to one of Transmission modes defined in TS 36.213 [23], clause 7.1, where tm1 refers to transmission mode 1,
tm2 to transmission mode 2 etc.
transmissionModeDL-MBSFN
Indicates, for MBSFN, the transmission mode as defined in TS 36.213 [23], clause 7.1, where <i>tm1</i> refers to
transmission mode 1, <i>tm</i> 2 to transmission mode 2 etc for slot or subslot operation. In case of FDD, TM8 is not
applicable.
transmissionModeDL-nonMBSFN
Indicates, for non-MBSFN, the transmission mode as defined in TS 36.213 [23], clause 7.1, where <i>tm1</i> refers to
transmission mode 1, <i>tm</i> 2 to transmission mode 2 etc. for slot or subslot operation. In case of FDD, TM8 is not
applicable.
ue-TransmitAntennaSelection
For value setup, the field indicates whether UE transmit antenna selection control is closed-loop or open-loop as
described in TS 36.213 [23], clause 8.7.
ue-TxAntennaSelection-SRS-1T4R-Config
Configuration of UL closed-loop transmit antenna selection for UE to select one antenna among four antennas to
transmit SRS for the corresponding serving cell as described in TS 36.213 [23]. When <i>ue-TxAntennaSelection-SRS</i> -
174R-Config and ue-TransmitAntennaSelection are configured simultaneously for a given serving cell, the UE selects
one of the first two antennas for PUSCH transmission and selects one antenna among four antennas at each SRS
instance for SRS transmission for the corresponding serving cell as described in TS 36.213 [23].
ue-TxAntennaSelection-SRS-2T4R-NrOfPairs
Presence of the field indicates configuration of UL closed-loop transmit antenna selection for UE to select two
antennas among four antennas to transmit SRS simultaneously for the corresponding serving cell as described in TS
36.213 [23]. Further, the field indicates the number of antenna pairs to select from for SRS transmission for a given
serving cell as described in TS 36.213 [23]. Value two indicates the UE to select one antenna pair between two
antenna pairs to transmit SRS simultaneously at each SRS instance for the corresponding serving cell. Value three
indicates the UE to select one antenna pair among three antenna pairs to transmit SRS simultaneously at each SRS
instance for the corresponding serving cell. EUTRAN does not simultaneously configure <i>ue-TransmitAntennaSelection</i>
and ue-TxAntennaSelection-SRS-2T4R-NrOfPairs for a given serving cell.

Explanation		
The field is mandatory present if the <i>transmissionMode</i> is set to tm3, tm4, tm5 or tm6.		
Otherwise the field is not present and the UE shall delete any existing value for this field.		
The field is optional present, need OR, if AntennalnfoDedicated is included and		
transmissionMode is set to tm8. If AntennaInfoDedicated is included and		
transmissionMode is set to a value other than tm8, the field is not present and the UE		
shall delete any existing value for this field. Otherwise the field is not present.		
The field is mandatory present if the <i>transmissionMode-r10</i> is set to <i>tm3</i> , <i>tm4</i> , <i>tm5</i> or <i>tm6</i> .		
The field is optionally present, need OR, if the <i>transmissionMode-r10</i> is set to <i>tm8</i> or <i>tm9</i> .		
Otherwise the field is not present and the UE shall delete any existing value for this field.		

AntennaInfoUL

The IE AntennaInfoUL is used to specify the UL antenna configuration.

AntennalnfoUL information elements

```
-- ASN1START
AntennaInfoUL-r10 ::=
                           SEQUENCE {
                                       ENUMERATED {tml, tm2, spare6, spare5,
    transmissionModeUL-r10
                                                   spare4, spare3, spare2, spare1} OPTIONAL,
                                                                                               ___
Need OR
    fourAntennaPortActivated-r10
                                           ENUMERATED {setup}
                                                                       OPTIONAL
                                                                                       -- Need OR
}
AntennaInfoUL-STTI-r15 ::= SEQUENCE {
    transmissionModeUL-STTI-r15
                                       ENUMERATED {tm1, tm2}
                                                                  OPTIONAL
                                                                               -- Need OR
}
-- ASN1STOP
```

```
      AntennalnfoUL field descriptions

      fourAntennaPortActivated

      Parameter indicates if four antenna ports are used. See TS 36.213 [23], clause 8.2. E-UTRAN optionally configures fourAntennaPortActivated only if transmissionModeUL is set to tm2.

      transmissionModeUL

      Points to one of UL Transmission modes defined in TS 36.213 [23], clause 8.0, where tm1 refers to transmission mode 2 etc.

      transmissionModeUL-STTI

      Indicates the UL transmission mode as defined in TS 36.213 [23], clause 8.0, where tm1 refers to transmission mode 1 and tm2 to transmission mode 2 for slot or subslot operation.
```

- AUL-Config

-- ASN1START

The IE AUL-Config is used to specify the autonomous uplink configuration.

AUL-Config information element

ASNISTACI		
AUL-Config-r15 ::= CHOICE {		
release	NULL,	
setup	SEQUENCE {	
aul-CRNTI-r15		C-RNTI,
aul-Subframes-r15		BIT STRING (SIZE (40)),
aul-HARQ-Processes-r15		INTEGER (116),
transmissionModeUL-AUL-r15		ENUMERATED {tm1,tm2},
aul-StartingFullBW-InsideMC	OT-r15	BIT STRING (SIZE (5)),
aul-StartingFullBW-OutsideM	COT-r15	BIT STRING (SIZE (7)),
aul-StartingPartialBW-Insid	eMCOT-r15	ENUMERATED {034, 043, 052, 061, 00S1},
aul-StartingPartialBW-Outsi	deMCOT-r15	ENUMERATED {016, 025, 034, 043, 052, 061, 00S1},
aul-RetransmissionTimer-r15		ENUMERATED {psf4, psf5, psf6, psf8, psf10, psf12,
		psf20, psf28, psf37, psf44, psf68, psf84, psf100,
		psf116, psf132, psf164, psf324},
endingSymbolAUL-r15		INTEGER(1213),
subframeOffsetCOT-Sharing-r	15	INTEGER(24),
	10	

contentionWindowSizeTimer-r15

ENUMERATED {n0, n5, n10}

-- ASN1STOP

}

AUL-Config field description

aul-CRNTI AUL C-RNTI, see TS 36.321 [6].

aul-HARQ-Processes

This field indicates which HARQ process IDs are configured for AUL operation as described in TS 36.321 [6]. In case tm1 is configured for the transmissionModeUL-AUL the number of configured HARQ processes equals to field value. In case tm2 is configured for the transmissionModeUL-AUL the number of configured HARQ processes equals to double of the field value. The largest value of the HARQ process ID is equal to the number of configured HARQ processes.

aul-RetransmissionTimer

This timer is used to restrict both new transmission and retransmission for the same HARQ process for AUL operation as described in TS 36.321 [6]. Value psf4 corresponds to 4 PDCCH subframes etc,

aul-StartingFullBW-InsideCOT

This field indicates the AUL-specific set of PUSCH starting offset values for the AUL transmission inside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy the full channel bandwidth as described in TS 36.213 [23], clause 8.0. The left most bit corresponds to value 34, second bit corresponds to value 43, third bit corresponds to value 52, fourth bit corresponds to value 61 and last bit corresponds to value OS#1.

aul-StartingFullBW-OutsideCOT

This field indicates the AUL-specific set of PUSCH starting offset values for the AUL transmission outside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy the full channel bandwidth as described in TS 36.213 [23], clause 8.0. The left most bit corresponds to value 16, second bit corresponds to value 25, third bit corresponds to value 34, fourth bit corresponds to value 43, fifth bit corresponds to value 52, sixth bit corresponds to value 61 and last bit corresponds to value OS#1.

aul-StartingPartialBW-InsideCOT

This field indicates the exact AUL-specific PUSCH starting offset value for the AUL transmission inside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy partial channel bandwidth as described in TS 36.213 [23], clause 8.0. The value o34 corresponds to 34 and the value o43 corresponds to 43 and so on.

aul-StartingPartialBW-OutsideCOT

This field indicates the exact AUL-specific PUSCH starting offset value for the AUL transmission outside of eNB obtained MCOT when a UE configured with AUL configuration is allocated to occupy partial channel bandwidth as described in TS 36.213 [23], clause 8.0. The value o16 corresponds to 16 and the value o25 corresponds to 25 and so on.

aul-Subframes

This field indicates which subframes are allowed for AUL operation as described in TS 36.321 [6]. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod 4 = 0. Value 0 in the bitmap indicates that the corresponding subframe not allowed for AUL. Value 1 in the bitmap indicates that the corresponding subframe is allowed for AUL.

contentionWindowSizeTimer

This field indicates contention window size adjustment timer as described in TS 37.213 [94], clause 4.2.2. The value n0 corresponds to 0ms, value n5 corresponds to 5ms, value 10 corresponds to 10ms. The value is set to n0 or n5 if the absence of other technologies on the same carrier cannot be guaranteed. The value is set to n0 or n10 if the absence of other technologies on the same carrier can be guaranteed.

endingSymbolAUL

This field indicates PUSCH ending symbol of the last AUL subframe in an AUL burst as described in TS 36.211 [21], clause 4.1.3.

subframeOffsetCOT-Sharing

This field is COT sharing indication parameter X indicating if subframe n+X is an applicable subframe for UL to DL sharing as described in TS 37.213 [94], clause 4.1.3.

transmissionModeUL-AUL

This field indicates which UL transmission mode is used for AUL as described in TS 36.213 [23], clause 8.0, where tm1 refers to transmission mode 1, tm2 to transmission mode 2.

CQI-ReportAperiodic

The IE CQI-ReportAperiodic is used to specify the aperiodic CQI reporting configuration.

CQI-ReportAperiodic information elements

CHOICE { CQI-ReportAperiodic-r10 ::= NULL, release setup SEQUENCE { cqi-ReportModeAperiodic-r10 CQI-ReportModeAperiodic, aperiodicCSI-Trigger-r10 SEQUENCE { BIT STRING (SIZE (8)), trigger1-r10 BIT STRING (SIZE (8)) trigger2-r10 } OPTIONAL -- Need OR } } CQI-ReportAperiodic-v1250 ::= CHOICE { NULL, release setup SEQUENCE { aperiodicCSI-Trigger-v1250 SEQUENCE { ENUMERATED {s1, s2}, trigger-SubframeSetIndicator-r12 trigger1-SubframeSetIndicator-r12 BIT STRING (SIZE (8)), trigger2-SubframeSetIndicator-r12 BIT STRING (SIZE (8)) } } } CQI-ReportAperiodic-v1310 ::= CHOICE { NULT. release setup SEQUENCE { aperiodicCSI-Trigger-v1310 SEQUENCE { trigger1-r13 BIT STRING (SIZE (32)), trigger2-r13 BIT STRING (SIZE (32)), trigger3-r13 BIT STRING (SIZE (32)), trigger4-r13 BIT STRING (SIZE (32)), trigger5-r13 BIT STRING (SIZE (32)), trigger6-r13 BIT STRING (SIZE (32)) } OPTIONAL. -- Need ON aperiodicCSI-Trigger2-r13 CHOICE { release NULL, SEQUENCE { setup triggerl-SubframeSetIndicator-r13 BIT STRING (SIZE (32)), trigger2-SubframeSetIndicator-r13 BIT STRING (SIZE (32)), trigger3-SubframeSetIndicator-r13 BIT STRING (SIZE (32)), trigger4-SubframeSetIndicator-r13 BIT STRING (SIZE (32)), trigger5-SubframeSetIndicator-r13 BIT STRING (SIZE (32)), trigger6-SubframeSetIndicator-r13 BIT STRING (SIZE (32)) } } OPTIONAL -- Need ON } } CQI-ReportAperiodicProc-r11 ::= SEQUENCE { cqi-ReportModeAperiodic-r11 CQI-ReportModeAperiodic, trigger01-r11 BOOLEAN, trigger10-r11 BOOLEAN. trigger11-r11 BOOLEAN } SEQUENCE { CQI-ReportAperiodicProc-v1310 ::= trigger001-r13 BOOLEAN, trigger010-r13 BOOLEAN, trigger011-r13 BOOLEAN, trigger100-r13 BOOLEAN. BOOLEAN, trigger101-r13 trigger110-r13 BOOLEAN trigger111-r13 BOOLEAN } SEQUENCE { CQI-ReportAperiodicHybrid-r14 ::= triggers-r14 CHOICE { oneBit-r14 SEQUENCE { BIT STRING (SIZE (8)) trigger1-Indicator-r14 }, twoBit-r14 SEQUENCE { trigger01-Indicator-r14 BIT STRING (SIZE (8)), trigger10-Indicator-r14 BIT STRING (SIZE (8)), trigger11-Indicator-r14 BIT STRING (SIZE (8)) }, threeBit-r14 SEQUENCE { trigger001-Indicator-r14 BIT STRING (SIZE (32)), trigger010-Indicator-r14 BIT STRING (SIZE (32)),

```
trigger011-Indicator-r14 BIT STRING (SIZE (32)),
trigger100-Indicator-r14 BIT STRING (SIZE (32)),
trigger110-Indicator-r14 BIT STRING (SIZE (32)),
trigger111-Indicator-r14 BIT STRING (SIZE (32))
}
}
OPTIONAL -- Need OR
}
CQI-ReportModeAperiodic ::= ENUMERATED {
rm12, rm20, rm22, rm30, rm31,
rm32-v1250, rm10-v1310, rm11-v1310
}
-- ASN1STOP
```

CQI-ReportAperiodic field descriptions

aperiodicCSI-Trigger

Indicates for which serving cell(s) the aperiodic CSI report is triggered when one or more SCells are configured. trigger1-r10 corresponds to the CSI request field 10 while trigger1-r13 corresponds to the CSI request field 010, trigger2-r10 corresponds to the CSI request field 11 while trigger2-r13 corresponds to the CSI request field 011, trigger3-r13 corresponds to the CSI request field 100, see TS 36.213 [23], table 7.2.1-1A and table 7.2.1-1D, and so on. The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex=1 etc. Each bit has either value 0 (means no aperiodic CSI report is triggered) or value 1 (means the aperiodic CSI report is triggered). At most 5 bits can be set to value 1 in the bit string in aperidociCSI-Trigger-r10 and in aperiodicCSI-Trigger-v1250 and at most 32 bits can be set to value 1 in the bit string in aperiodicCSI-Trigger-v1310. E-UTRAN configures value 1 only for cells configured with transmissionMode set in range tm1 to tm9. One value applies for all serving cells configured with transmissionMode set in range tm1 to tm9 and belonging to the same PUCCH group (the associated functionality is common i.e. not performed independently for each cell).

trigger-SubframeSetIndicator

For a serving cell configured with csi-MeasSubframeSets-r12, indicates for which CSI subframe set the aperiodic CSI report is triggered for the serving cell if the aperiodic CSI is triggered by the CSI request field 01 or 001, see TS 36.213 [23], table 7.2.1-1C or table 7.2.1.-1E. Value s1 corresponds to CSI subframe set 1 and value s2 corresponds to CSI subframe set 2.

trigger001

Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 001, for a CSI request applicable for the serving cell on the same frequency as the CSI process, see TS 36.213 [23], table 7.2.1-1D and 7.2.1-E.

trigger001-IndicatorN.. trigger111-IndicatorN

Indicates for which eMIMO-Type the aperiodic CSI report is triggered (the corresponding CSI process, CSI subframe set}-pair(s) and/or a serving cell) as applicable, See TS 36.213 [23], table 7.2.1-1A, 7.2.1-1B, and 7.2.1-1C. trigger01

Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 01, for a CSI request applicable for the serving cell on the same frequency as the CSI process, see TS 36.213 [23], table 7.2.1-1D and 7.2.1-1E.

trigger010, trigger011, trigger100, trigger101, Trigger110, Trigger111

Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 010, 011, 100, 101, 110 or 111, see TS 36.213 [23], table 7.2.1-1D and 7.2.1-1E.

trigger10, trigger11

Indicates whether or not reporting for this CSI-process or reporting for this CSI-process corresponding to a CSI subframe set is triggered by CSI request field set to 10 or 11, see TS 36.213 [23], table 7.2.1-1B. EUTRAN configures at most 5 CSI processes, across all serving frequencies within each CG, to be triggered by a CSI request field set to value 10. The same restriction applies for value 11. In case E-UTRAN simultaneously triggers CSI requests for more than 5 CSI processes some limitations apply, see TS 36.213 [23].

trigger1-SubframeSetIndicator

If signalled in the aperiodicCSI-Trigger-v1250, indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 10, see TS 36.213 [23], table 7.2.1-1C, or by the CSI request field 010, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex=1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2).

trigger2-SubframeSetIndicator

If signalled in the aperiodicCSI-Trigger-v1250, indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 11, see TS 36.213 [23], table 7.2.1-1C, or by the CSI request field 011, see TS 36.213 [23], table 7.2.1-1E.The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex=1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2).

trigger3-SubframeSetIndicator

Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field100, see TS 36.213 [23], table 7.2.1-1E. The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2).

trigger4-SubframeSetIndicator

Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 101, see TS 36.213 [23], table 7.2.1-1E. The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2).

CQI-ReportAperiodic field descriptions

trigger5-SubframeSetIndicator

Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 110, see TS 36.213 [23], table 7.2.1-1E. The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2).

trigger6-SubframeSetIndicator

Indicates for which CSI subframe set the aperiodic CSI report is triggered when aperiodic CSI is triggered by the CSI request field 111, see TS 36.213 [23], table 7.2.1-1E. The leftmost bit, bit 0 in the bit string corresponds to the cell with ServCellIndex=0 and bit 1 in the bit string corresponds to the cell with ServCellIndex =1 etc. Each bit has either value 0 (means that aperiodic CSI report is triggered for CSI subframe set 1) or value 1 (means that aperiodic CSI report is triggered for CSI subframe set 2).

_

-- ASN1START

CQI-ReportBoth

The IE *CQI-ReportBoth* is used to specify the CQI reporting configuration common to both periodic and aperiodic configurations.

CQI-ReportBoth information elements

```
COI-ReportBoth-r11 ::=
                             SEOUENCE {
   csi-IM-ConfigToReleaseList-rl1 CSI-IM-ConfigToReleaseList-rl1 OPTIONAL,
                                                                                -- Need ON
                                                                    OPTIONAL,
   csi-IM-ConfigToAddModList-r11
                                      CSI-IM-ConfigToAddModList-r11
                                                                                -- Need ON
   csi-ProcessToReleaseList-r11
                                      CSI-ProcessToReleaseList-r11
                                                                    OPTIONAL,
                                                                                -- Need ON
   csi-ProcessToAddModList-r11
                                      CSI-ProcessToAddModList-r11
                                                                    OPTIONAL
                                                                                -- Need ON
}
CQI-ReportBoth-v1250 ::=
                                 SEOUENCE {
   csi-IM-ConfigId-v1250 OPTIONAL,
                                                                            -- Need ON
                                                                OPTIONAL
   csi-IM-ConfigToAddModListExt-r12
                                         CSI-IM-ConfigExt-r12
                                                                            -- Need ON
}
CQI-ReportBoth-v1310 ::=
                                  SEQUENCE {
   csi-IM-ConfigToReleaseListExt-r13 CSI-IM-ConfigToReleaseListExt-r13 OPTIONAL,
                                                                                    -- Need ON
   csi-IM-ConfigToAddModListExt-r13 CSI-IM-ConfigToAddModListExt-r13
                                                                        OPTIONAL
                                                                                    -- Need ON
}
CSI-IM-ConfigToAddModList-r11 ::=
                                     SEQUENCE (SIZE (1..maxCSI-IM-r11)) OF CSI-IM-Config-r11
CSI-IM-ConfigToAddModListExt-r13 ::=
                                     SEQUENCE (SIZE (1..maxCSI-IM-v1310)) OF CSI-IM-ConfigExt-r12
CSI-IM-ConfigToReleaseList-r11 ::=
                                     SEQUENCE (SIZE (1..maxCSI-IM-r11)) OF CSI-IM-ConfigId-r11
CSI-IM-ConfigToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-IM-v1310)) OF CSI-IM-ConfigId-
v1310
CSI-ProcessToAddModList-r11 ::=
                                  SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF CSI-Process-r11
CSI-ProcessToReleaseList-r11 ::=
                                  SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF CSI-ProcessId-r11
CQI-ReportBothProc-r11 ::=
                                  SEQUENCE {
   ri-Ref-CSI-ProcessId-r11
                                                                    OPTIONAL,
                                      CSI-ProcessId-r11
                                                                                    -- Need OR
   pmi-RI-Report-r11
                                      ENUMERATED {setup}
                                                                    OPTIONAL
                                                                                    -- Need OR
-- ASN1STOP
```

CQI-ReportBoth field descriptions

csi-IM-ConfigToAddModList

For a serving frequency E-UTRAN configures one or more *CSI-IM-Config* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

csi-ProcessToAddModList

For a serving frequency E-UTRAN configures one or more *CSI-Process* only when transmission mode 10 is configured for the serving cell on this carrier frequency.

cqi-ReportModeAperiodic

Parameter: *reporting mode*. Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to Mode 2-2 etc. PUSCH reporting modes are described in TS 36.213 [23], clause 7.2.1. The UE shall ignore *cqi*-*ReportModeAperiodic-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency. The UE shall ignore *cqi*-*ReportModeAperiodic-r10* configured for the PCell/PSCell when the transmission bandwidth of the PCell/PSCell in downlink is 6 resource blocks.

pmi-RI-Report

See TS 36.213 [23], clause 7.2. The presence of this field means PMI/RI reporting is configured; otherwise the PMI/RI reporting is not configured. EUTRAN configures this field only when *transmissionMode* is set to *tm8, tm9* or *tm10*. The UE shall ignore *pmi-RI-Report-r9/ pmi-RI-Report-r10* when transmission mode 10 is configured for the serving cell on this carrier frequency.

ri-Ref-CSI-ProcessId

CSI process whose RI value the UE inherits when reporting RI, in the same subframe, for CSI reporting. E-UTRAN ensures that the CSI process that inherits the RI value is configured in accordance with the conditions specified in TS 36.213 [23], clauses 7.2.1 and 7.2.2.

– CQI-ReportConfig

The IE CQI-ReportConfig is used to specify the CQI reporting configuration.

CQI-ReportConfig information elements

```
-- ASN1START
CQI-ReportConfig ::=
                                  SEQUENCE {
   cqi-ReportModeAperiodic
                                  CQI-ReportModeAperiodic OPTIONAL,
                                                                             -- Need OR
   nomPDSCH-RS-EPRE-Offset
                                     INTEGER (-1..6),
   cqi-ReportPeriodic
                                  CQI-ReportPeriodic OPTIONAL
                                                                             -- Need ON
}
CQI-ReportConfig-v920 ::=
                             SEOUENCE {
                                  ENUMERATED {setup}
   cgi-Mask-r9
                                                         OPTIONAL,
                                                                         -- Cond cqi-Setup
                                  ENUMERATED {setup}
   pmi-RI-Report-r9
                                                         OPTIONAL
                                                                         -- Cond PMIRI
}
                          SEQUENCE {
CQI-ReportConfig-r10 ::=
                                      CQI-ReportAperiodic-r10
   cqi-ReportAperiodic-r10
                                                                    OPTIONAL,
                                                                                 -- Need ON
   nomPDSCH-RS-EPRE-Offset
                                  INTEGER (-1..6),
                                      CQI-ReportPeriodic-r10
   cqi-ReportPeriodic-r10
                                                                     OPTIONAL,
                                                                                 -- Need ON
   pmi-RI-Report-r9
                                      ENUMERATED {setup}
                                                                     OPTIONAL,
                                                                                 -- Cond
PMIRIPCell
   csi-SubframePatternConfig-r10
                                      CHOICE {
       release
                                      NULL,
                                      SEQUENCE {
       setup
           csi-MeasSubframeSet1-r10
                                             MeasSubframePattern-r10.
           csi-MeasSubframeSet2-r10
                                              MeasSubframePattern-r10
       }
   }
                                                                     OPTIONAL
                                                                                 -- Need ON
}
CQI-ReportConfig-v1130 ::= SEQUENCE {
   cqi-ReportPeriodic-v1130
                                      CQI-ReportPeriodic-v1130,
   cqi-ReportBoth-r11
                                      CQI-ReportBoth-r11
}
CQI-ReportConfig-v1250 ::=
                             SEQUENCE {
                                      CHOICE {
   csi-SubframePatternConfig-r12
                                      NULL,
       release
       setup
                                      SEQUENCE {
                                           BIT STRING (SIZE (10))
           csi-MeasSubframeSets-r12
       }
                                          OPTIONAL, -- Need ON
CQI-ReportBoth-v1250 OPTIONAL, -- Need ON
    cqi-ReportBoth-v1250
   cqi-ReportAperiodic-v1250 CQI-ReportAperiodic-v1250 OPTIONAL, -- Need ON
   altCQI-Table-r12
                              ENUMERATED {
```

}	allSubframes, csi-SubframeSet1, csi-SubframeSet2, spare1} OPTIC	ONAL Need OP
CQI-ReportConfig-v1310 ::= cqi-ReportBoth-v1310 cqi-ReportAperiodic-v1310 cqi-ReportPeriodic-v1310 }	CQI-ReportAperiodic-v1310	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL Need ON
CQI-ReportConfig-v1320 ::= cqi-ReportPeriodic-v1320 }	SEQUENCE { CQI-ReportPeriodic-v1320 0	OPTIONAL Need ON
CQI-ReportConfig-v1430 ::= cqi-ReportAperiodicHybrid-r }	SEQUENCE { 14 CQI-ReportAperiodicHybrid-r1	4 OPTIONAL Need ON
CQI-ReportConfig-v1530 ::= SEQ altCQI-Table-1024QAM-r15 }	UENCE { ENUMERATED { allSubframes, csi-SubframeSet1, csi-SubframeSet2, spare1}	OPTIONAL Need OP
<pre>CQI-ReportConfig-r15 ::= CHOICE release NULL, setup SEQUENC cqi-ReportConfig-r10 cqi-ReportConfig-v1130 cqi-ReportConfigPCell-v1250 cqi-ReportConfig-v1310 cqi-ReportConfig-v1320 cqi-ReportConfig-v1430 altCQI-Table-1024QAM-r15 } </pre>	E { CQI-ReportConfig-r10 (CQI-ReportConfig-v1130 (CQI-ReportConfig-v1250 (CQI-ReportConfig-v1310 (CQI-ReportConfig-v1320 (CQI-ReportConfig-v1430 (ENUMERATED {allSubframes, csi-Sul	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON bframeSet1, OPTIONAL Need OP
<pre>CQI-ReportConfigSCell-r10 ::= cqi-ReportModeAperiodic-r10 nomPDSCH-RS-EPRE-Offset-r10 cqi-ReportPeriodicSCell-r10 pmi-RI-Report-r10 PMIRISCell }</pre>	~	, Need OR OPTIONAL, Need ON OPTIONAL Cond
CQI-ReportConfigSCell-r15 ::= cqi-ReportPeriodicSCell-r15 altCQI-Table-1024QAM-r15 OP }	SEQUENCE { CQI-ReportPeriodicSCell-r15 ENUMERATED {allSubframes, cs: csi-SubframeSet2, sparel}	OPTIONAL, Need ON i-SubframeSet1, OPTIONAL Need

	CQI-ReportConfig field descriptions
	le, altCQI-Table-1024QAM
aperiodic ar table applies CQI table ap subframe se range <i>tm1</i> to tables apply configure <i>al</i> in <i>CQI-Repo</i>	e applicability of the alternative CQI table (i.e. Table 7.2.3-2 and Table 7.2.3-4 in TS 36.213 [23]) for both ad periodic CSI reporting for the concerned serving cell. Value <i>allSubframes</i> means the alternative CQI is to all the subframes and CSI processes, if configured, and value <i>csi-SubframeSet1</i> means the alternative oplies to CSI subframe set1, and value <i>csi-SubframeSet2</i> means the alternative CQI table applies to CSI etc. EUTRAN sets the value to <i>csi-SubframeSet1</i> or <i>csi-SubframeSet2</i> only if <i>transmissionMode</i> is set in o <i>tm9</i> and <i>csi-SubframePatternConfig-r10</i> is configured for the concerned serving cell and different CQI to the two CSI subframe sets; otherwise EUTRAN sets the value to <i>allSubframes</i> . EUTRAN does not <i>tCQI-Table-r12</i> in <i>CQI-ReportConfig-v1250</i> and <i>altCQI-Table-1024QAM-r15</i> in <i>CQI-ReportConfig-v1530</i> or <i>ortConfigSCell-r15</i> in the same serving cell simultaneously. If <i>altCQI-Table-r12</i> and <i>altCQI-Table- 15</i> are absent, the UE shall use Table 7.2.3-1 in TS 36.213 [23] for all subframes and CSI processes, if
cqi-Mask	
Limits CQI/F	PMI/PTI/RI reports to the on-duration period of the DRX cycle, see TS 36.321 [6]. One value applies for all see and all serving cells (the associated functionality is common i.e. not performed independently for each
cqi-Report/	
UTRAN con configured.	oes not configure CQI-ReportAperiodic when transmission mode 10 is configured for all serving cells. E- figures cqi-ReportAperiodic-v1250 only if cqi-ReportAperiodic-r10 and csi-MeasSubframeSets-r12 are E-UTRAN configures cqi-ReportAperiodic-v1310 only if cqi-ReportAperiodic-r10 is configured.
	ModeAperiodic
to Mode 2-2 <i>ReportMode</i> UE shall ign	reporting mode. Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to etc. PUSCH reporting modes are described in TS 36.213 [23], clause 7.2.1. The UE shall ignore <i>cqi</i> - eAperiodic-r10 when transmission mode 10 is configured for the serving cell on this carrier frequency. The lore <i>cqi</i> -ReportModeAperiodic-r10 configured for the PCell/ PSCell when the transmission bandwidth of the ll in downlink is 6 resource blocks.
cqi-Report	
E-UTRAN d	oes not configure CQI-ReportPeriodic for sTTI within CQI-ReportConfig.
Indicates the the subfram CSI subfram MeasSubfra	<i>ubframeSets</i> e two CSI subframe sets. Value 0 means the subframe belongs to CSI subframe set 1 and value 1 means e belongs to CSI subframe set 2. CSI subframe set 1 refers to $C_{CSI,0}$ in TS 36.213 [23], clause 7.2, and ne set 2 refers to $C_{CSI,1}$ in TS 36.213 [23], clause 7.2. EUTRAN does not configure <i>csi-</i> <i>ameSet1-r10</i> and <i>csi-MeasSubframeSet2-r10</i> if either <i>csi-MeasSubframeSets-r12</i> for PCell or <i>eimta-</i> <i>PCell-r12</i> is configured.
csi-MeasSu	ıbframeSet1, csi-MeasSubframeSet2
and csi-Mea	e CSI measurement subframe sets. <i>csi-MeasSubframeSet1</i> refers to $C_{CSI,0}$ in TS 36.213 [23], clause 7.2 asSubframeSet2 refers to $C_{CSI,1}$ in TS 36.213 [23], clause 7.2. E-UTRAN only configures the two CSI nt subframe sets for the PCeII.
nomPDSCH	H-RS-EPRE-Offset
Parameter:	Δ_{offset} see TS 36.213 [23], clause 7.2.3. Actual value = field value * 2 [dB].
<i>pmi-RI-Rep</i> See TS 36.2 reporting is	<i>port</i> 213 [23], clause 7.2. The presence of this field means PMI/RI reporting is configured; otherwise the PMI/RI not configured. EUTRAN configures this field only when <i>transmissionMode</i> is set to <i>tm8, tm9</i> or <i>tm10</i> . The ore <i>pmi-RI-Report-r9/ pmi-RI-Report-r10</i> when transmission mode 10 is configured for the serving cell on

ETSI

Conditional presence	Explanation
cqi-Setup	This field is not present for an Scell except for the PSCell, while it is conditionally present for the PCell and the PSCell according to the following. The field is optional present, need OR, if the <i>cqi-ReportPeriodic</i> in the <i>cqi-ReportConfig</i> is set to <i>setup</i> . If the field <i>cqi-ReportPeriodic</i> is present and set to <i>release</i> , the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.
PMIRI	The field is optional present, need OR, if <i>cqi-ReportPeriodic</i> is included and set to <i>setup</i> , or <i>cqi-ReportModeAperiodic</i> is included. If the field <i>cqi-ReportPeriodic</i> is present and set to <i>release</i> and <i>cqi-ReportModeAperiodic</i> is absent, the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.
PMIRIPCell	The field is optional present, need OR, if <i>cqi-ReportPeriodic</i> is included in the <i>CQI-ReportConfig-r10</i> and set to <i>setup</i> , or <i>cqi-ReportAperiodic</i> is included in the <i>CQI-ReportConfig-r10</i> and set to <i>setup</i> . If the field <i>cqi-ReportPeriodic</i> is present in the <i>CQI-ReportConfig-r10</i> and set to <i>release</i> and <i>cqi-ReportAperiodic</i> is included in the <i>CQI-ReportConfig-r10</i> and set to <i>release</i> and <i>cqi-ReportAperiodic</i> is included in the <i>CQI-ReportConfig-r10</i> and set to <i>release</i> , the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.
PMIRISCell	The field is optional present, need OR, if <i>cqi-ReportPeriodicSCell</i> is included and set to <i>setup</i> , or <i>cqi-ReportModeAperiodic-r10</i> is included in the <i>CQI-ReportConfigSCell</i> . If the field <i>cqi-ReportPeriodicSCell</i> is present and set to <i>release</i> and <i>cqi-ReportModeAperiodic-r10</i> is absent in the <i>CQI-ReportConfigSCell</i> , the field is not present and the UE shall delete any existing value for this field. Otherwise the field is not present.

_

CQI-ReportPeriodic

The IE *CQI-ReportPeriodic* is used to specify the periodic CQI reporting configuration elements.

CQI-ReportPeriodic information elements

ASN1START	
CQI-ReportPeriodic ::= CHOICE { release NULL, setup SEQUENCE { cqi-PUCCH-ResourceIndex INTEGER (01185), cqi-pmi-ConfigIndex INTEGER (01023), cqi-FormatIndicatorPeriodic CHOICE { widebandCQI NULL, subbandCQI SEQUENCE { k INTEGER (14) }	
ri-ConfigIndex INTEGER (01023) OPTIONAL, simultaneousAckNackAndCQI BOOLEAN	Need OR
}	
CQI-ReportPeriodic-r10 ::= CHOICE { release NULL, setup SEQUENCE { cqi-PUCCH-ResourceIndex-r10 INTEGER (01184), cqi-PUCCH-ResourceIndexP1-r10 INTEGER (01184) OPTIONAL, cqi-pmi-ConfigIndex INTEGER (01023), cqi-FormatIndicatorPeriodic-r10 CHOICE { widebandCQI-r10 SEQUENCE { csi-ReportMode-r10 ENUMERATED {submode1, submode2} OPTIONAL }, subbandCQI-r10 SEQUENCE { k INTEGER (14), periodicityFactor-r10 ENUMERATED {n2, n4} }	Need OR Need OR
}, ri-ConfigIndex INTEGER (01023) OPTIONAL, simultaneousAckNackAndCQI BOOLEAN,	Need OR
cqi-Mask-r9 ENUMERATED {setup} OPTIONAL, csi-ConfigIndex-r10 CHOICE { release NULL, setup SEQUENCE { cqi-pmi-ConfigIndex2-r10 INTEGER (01023), ri-ConfigIndex2-r10 INTEGER (01023) OPTIONAL	Need OR Need OR
} OPTIONAL }	Need ON

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```
CQI-ReportPeriodic-v1130 ::=
                             SEQUENCE {
   simultaneousAckNackAndCQI-Format3-r11
                                              ENUMERATED {setup}
                                                                    OPTIONAL,
                                                                                 -- Need OR
   cqi-ReportPeriodicProcExtToReleaseList-rll CQI-ReportPeriodicProcExtToReleaseList-rll
   OPTIONAL,
              -- Need ON
   cqi-ReportPeriodicProcExtToAddModList-rll CQI-ReportPeriodicProcExtToAddModList-rll OPTIONAL
    -- Need ON
}
CQI-ReportPeriodic-v1310 ::= SEQUENCE {
cri-ReportConfig-r13 CRI-ReportConfig-r13 OPTIONAL, -- Need OR
   simultaneousAckNackAndCQI-Format4-Format5-r13 ENUMERATED {setup} OPTIONAL-- Need OR
}
CQI-ReportPeriodic-v1320 ::= SEQUENCE {
periodicityFactorWB-r13 ENUMERATED {n2, n4} OPTIONAL -- Need OR
}
CQI-ReportPeriodicSCell-r15 ::= CHOICE {
   release
                                       NULL,
                                      SEQUENCE {
   setup
       cqi-pmi-ConfigIndexDormant-r15
                                         INTEGER (0..1023),
                                          INTEGER (0..1023)
       ri-ConfigIndexDormant-r15
                                                                OPTIONAL,
                                                                               -- Need OR
       csi-SubframePatternDormant-r15
                                          CHOICE {
           release
                                         NULL,
                                          SEQUENCE {
           setup
               csi-MeasSubframeSet1-r15 MeasSubframePattern-r10,
MeasSubframePattern-r10
               csi-MeasSubframeSet1-r15
           }
                                                                      OPTIONAL, -- Need ON
       }
       cqi-FormatIndicatorDormant-r15 CHOICE {
                                       SEQUENCE {
           widebandCQI-r15
              lebandCQI-r15SEQUENCE {csi-ReportMode-r15ENUMERATED {submode1, submode2} OPTIONAL-- Need OR
           }.
                            SEQUENCE {
           subbandCQI-r15
               periodicityFactor-r15 ENUMERATED (200
              k-r15
                                          ENUMERATED {n2, n4}
           }
       }
                                                                  OPTIONAL
                                                                                -- Need OR
   }
}
CQI-ReportPeriodicProcExtToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCQI-ProcExt-r11)) OF CQI-
ReportPeriodicProcExt-r11
CQI-ReportPeriodicProcExtToReleaseList-rll ::= SEQUENCE (SIZE (1..maxCQI-ProcExt-rll)) OF CQI-
ReportPeriodicProcExtId-r11
                                      SEQUENCE {
COI-ReportPeriodicProcExt-r11 ::=
   cqi-ReportPeriodicProcExtId-r11 CQI-ReportPeriodicProcExtId-r11,
   cqi-pmi-ConfigIndex-r11 INTEGER (0..1023),
   cqi-FormatIndicatorPeriodic-r11 CHOICE {
          csi-ReportMode-r11 SEQUENCE {
       widebandCQI-r11
                                     ENUMERATED {submode1, submode2} OPTIONAL -- Need OR
       },
       subbandCQI-r11
                                SEQUENCE {
           k INTEGER (1..4),
periodicityFactor-r11 ENUMERATED {n2, n4}
           k
       }
   csi-ConfigIndex-rll
release
                                 INTEGER (0..1023)
                                                                     OPTIONAL,
                                                                                  -- Need OR
                                 CHOICE {
                                      NULL
                                      SEQUENCE {
       setup
           cqi-pmi-ConfigIndex2-rl1 INTEGER (0..1023),
ri-ConfigIndex2-rl1 INTEGER (0..1023)
                                                                  OPTIONAL
                                                                                  -- Need OR
       }
   }
                                                                  OPTIONAL, -- Need ON
   [[ cri-ReportConfig-r13
                                      CRI-ReportConfig-r13
                                                                         OPTIONAL -- Need ON
   11,
                                     ENUMERATED {n2, n4}
   [[ periodicityFactorWB-r13
                                                                  OPTIONAL
                                                                                -- Need ON
    ]]
}
CQI-ShortConfigSCell-r15 ::= CHOICE {
```

```
release
                                                 NULL,
          up SEQUENCE {
cqi-pmi-ConfigIndexShort-r15 INTEGER (0..1023),
ri ConfigIndexShort-r15 ConfigIndexShort-r15
    setup
          ri-ConfigIndexShort-r15 INTEGER (0..1023) OPTIONAL, -- Need OR
cqi-FormatIndicatorShort-r15 CHOICE {
widebandCQI-Short-r15 SEQUENCE {
csi-ReportModeShort-r15 ENUMERATED {submode1, submode2} OPTIONAL -- Need OR
               },
               subbandCQI-Short-r15 SEQUENCE {
                                                    INTEGER (1..4),
                   k-r15
                    periodicityFactor-r15
                                                        ENUMERATED {n2, n4}
               }
          }
                                                                                       OPTIONAL -- Need OR
    }
}
                                            CHOICE {
CRI-ReportConfig-r13 ::=
   release
setup
                                             NULL,
SEQUENCE {
          up SEQUENCE {
cri-ConfigIndex-r13 CRI-ConfigIndex-r13,
cri-ConfigIndex2-r13 CRI-ConfigIndex-r13 (
         cri-ConfigIndex-r13
                                                        CRI-ConfigIndex-r13 OPTIONAL -- Need OR
     }
}
                                INTEGER (0..1023)
CRI-ConfigIndex-r13 ::=
-- ASN1STOP
```

CQI-ReportPeriodic field descriptions

cgi-FormatIndicatorPeriodic

Parameter: PUCCH CQI Feedback Type, see TS 36.213 [23], table 7.2.2-1. Depending on transmissionMode, reporting mode is implicitly given from the table.

cqi-Mask

Limits CQI/PMI/PTI/RI reports to the on-duration period of the DRX cycle, see TS 36.321 [6]. One value applies for all CSI processes and all serving cells (the associated functionality is common i.e. not performed independently for each cell).

cqi-pmi-ConfigIndex

Parameter: CQI/PMI Periodicity and Offset Configuration Index ICQVPMI, see TS 36.213 [23], tables 7.2.2-1A and 7.2.2-1C. If subframe patterns for CSI (CQI/PMI/PTI/RI) reporting are configured (i.e. csi-SubframePatternConfig is configured), the parameter applies to the subframe pattern corresponding to csi-MeasSubframeSet1 or corresponding to the CSI subframe set 1 indicated by csi-MeasSubframeSets-r12.

cqi-pmi-ConfigIndex2

Parameter: CQI/PMI Periodicity and Offset Configuration Index ICQUPMI, see TS 36.213 [23], tables 7.2.2-1A and 7.2.2-1C. The parameter applies to the subframe pattern corresponding to csi-MeasSubframeSet2 or corresponding to the CSI subframe set 2 indicated by csi-MeasSubframeSets-r12.

cgi-PUCCH-ResourceIndex, cgi-PUCCH-ResourceIndexP1

Parameter $n_{PUCCH}^{(2,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 7.2. E-

UTRAN does not apply value 1185. One value applies for all CSI processes.

cqi-ReportAperiodic

E-UTRAN does not configure CQI-ReportAperiodic when transmission mode 10 is configured for all serving cells. E-UTRAN configures cqi-ReportAperiodic-v1250 only if cqi-ReportAperiodic-r10 and csi-MeasSubframeSets-r12 are configured. E-UTRAN configures cqi-ReportAperiodic-v1310 only if cqi-ReportAperiodic-r10 is configured.

cgi-ReportModeAperiodic

Parameter: reporting mode. Value rm12 corresponds to Mode 1-2, rm20 corresponds to Mode 2-0, rm22 corresponds to Mode 2-2 etc. PUSCH reporting modes are described in TS 36.213 [23], clause 7.2.1. The UE shall ignore cqi-ReportModeAperiodic-r10 when transmission mode 10 is configured for the serving cell on this carrier frequency. The UE shall ignore cai-ReportModeAperiodic-r10 configured for the PCell/PSCell when the transmission bandwidth of the PCell/PSCell in downlink is 6 resource blocks.

CQI-ReportPeriodicProcExt

A set of periodic CQI related parameters for which E-UTRAN may configure different values for each CSI process. For a serving frequency E-UTRAN configures one or more CQI-ReportPeriodicProcExt only when transmission mode 10 is configured for the serving cell on this carrier frequency.

cri-ConfigIndex

Parameter: cri-ConfigIndex ICR/see TS 36.213 [23]. The parameter applies to the subframe pattern corresponding to csi-MeasSubframeSet1. EUTRAN configures the field if subframe patterns for CSI (CQI/PMI/PTI/RI/CRI) reporting are configured (i.e. csi-SubframePatternConfig is configured).

cri-ConfigIndex2

Parameter: cri-ConfigIndex ICR/see TS 36.213 [23]. The parameter applies to the subframe pattern corresponding to csi-MeasSubframeSet2 or corresponding to the CSI subframe set 2 indicated by csi-MeasSubframeSets. E-UTRAN configures cri-ConfigIndex2 only if cri-ConfigIndex is configured.

cri-ReportConfig

E-UTRAN configures the field only if the UE is configured with eMIMO-Type set to "beamformed" and if multiple references to RS configuration using non-zero power transmission are configured (i.e. if csi-RS-ConfigNZPIdListExt is configured)

csi-ConfigIndex

E-UTRAN configures csi-ConfigIndex only for PCell and only if csi-SubframePatternConfig is configured. The UE shall release csi-ConfigIndex if csi-SubframePatternConfig is released.

csi-ProcessToAddModList

For a serving frequency E-UTRAN configures one or more CSI-Process only when transmission mode 10 is configured for the serving cell on this carrier frequency.

csi-ReportMode

Parameter: PUCCH_format1-1_CSI_reporting_mode, see TS 36.213 [23], clause 7.2.2.

κ

Parameter: K, see TS 36.213 [23], clause 7.2.2.

nomPDSCH-RS-EPRE-Offset

Parameter: Δ_{offset} see TS 36.213 [23], clause 7.2.3. Actual value = field value * 2 [dB].

periodicityFactor, periodicityFactorWB

Parameter: H', see TS 36.213 [23], clause 7.2.2. EUTRAN configures field periodicityFactorWB only when the UE is configured with eMIMO-Type set to nonPrecoded and with cqi-FormatIndicatorPeriodic set to widebandCQI.

ri-ConfigIndex

Parameter: RI Config Index IRI, see TS 36.213 [23], clause 7.2.2-1B. If subframe patterns for CSI (CQI/PMI/PTI/RI/CRI) reporting are configured (i.e. csi-SubframePatternConfig is configured), the parameter applies

to the subframe pattern corresponding to csi-MeasSubframeSet1.

CQI-ReportPeriodic field descriptions

ri-ConfigIndex2

Parameter: *RI Config Index I_{RI}*, see TS 36.213 [23], clause 7.2.2-1B. The parameter applies to the subframe pattern corresponding to *csi-MeasSubframeSet2* or corresponding to the CSI subframe set 2 indicated by *csi-MeasSubframeSets-r12*. E-UTRAN configures *ri-ConfigIndex2* only if *ri-ConfigIndex* is configured.

simultaneousAckNackAndCQI

Parameter: *Simultaneous-AN-and-CQI*, see TS 36.213 [23], clause 10.1. TRUE indicates that simultaneous transmission of ACK/NACK and CQI is allowed. One value applies for all CSI processes. For SCells except for the PSCell and PUCCH SCell this field is not applicable and the UE shall ignore the value.

simultaneousAckNackAndCQI-Format3

Indicates that the UE shall perform simultaneous transmission of HARQ A/N and periodic CQI report multiplexing on PUCCH format 3, see TS 36.213 [23], clauses 7.2 and 10.1.1. E-UTRAN configures this information only when *pucch-Format* is set to *format*3. One value applies for all CSI processes. For SCells except for the PSCell and PUCCH SCell this field is not applicable and the UE shall ignore the value.

simultaneousAckNackAndCQI-Format4-Format5

Indicates that the UE shall perform simultaneous transmission of HARQ A/N and periodic CSI report multiplexing on PUCCH format 4 and format 5, see TS 36.213 [23], clause 10.1.1. E-UTRAN configures this information only when *pucch-Format* is set to *format4* or *format5*. One value applies for all CSI processes. For SCells except for the PSCell and PUCCH SCell this field is not applicable and the UE shall ignore the value.

CQI-ReportPeriodicProcExtId

The IE *CQI-ReportPeriodicProcExtId* is used to identify a periodic CQI reporting configuration that E-UTRAN may configure in addition to the configuration specified by the IE *CQI-ReportPeriodic-r10*. These additional configurations are specified by the IE *CQI-ReportPeriodicProcExt-r11*. The identity is unique within the scope of a carrier frequency.

CQI-ReportPeriodicProcExtId information elements

-- ASN1START CQI-ReportPeriodicProcExtId-r11 ::= INTEGER (1..maxCQI-ProcExt-r11)

-- ASN1STOP

CrossCarrierSchedulingConfig

The IE *CrossCarrierSchedulingConfig* is used to specify the configuration when the cross carrier scheduling is used in a cell.

CrossCarrierSchedulingConfig information elements

ASN1START		
CrossCarrierSchedulingConfig-r10 ::= schedulingCellInfo-r10 own-r10	SEQUENCE { CHOICE { SEQUENCE {	No cross carrier
scheduling		
<pre>cif-Presence-r10 },</pre>	BOOLEAN	
other-r10	SEQUENCE {	Cross carrier
<pre>scheduling</pre>	ServCellIndex-r10, INTEGER (14)	
CrossCarrierSchedulingConfig-r13 ::=	SEQUENCE {	
schedulingCellInfo-r13 own-r13 scheduling	CHOICE { SEQUENCE {	No cross carrier
cif-Presence-r13 },	BOOLEAN	
other-r13 schedulingCellId-r13 pdsch-Start-r13 cif-InSchedulingCell-r13 }	SEQUENCE { ServCellIndex-r13, INTEGER (14), INTEGER (17)	Cross carrier scheduling

}	
CrossCarrierSchedulingConfigLAA-UL-r14 ::= schedulingCellId-r14 cif-InSchedulingCell-r14 } ASN1STOP	SEQUENCE { ServCellIndex-r13, INTEGER (17)

CrossCarrierSchedulingConfig field descriptions

The field is used to indicate whether carrier indicator field is present (value TRUE) or not (value FALSE) in PDCCH/ EPDCCH DCI formats, see TS 36.212 [22], clause 5.3.3.1.

cif-InSchedulingCell

The field indicates the CIF value used in the scheduling cell to indicate this cell, see TS 36.212 [22], clause 5.3.3.1. In case of carrier indicator field is present, the CIF value is 0.

pdsch-Start

cif-Presence

The starting OFDM symbol of PDSCH for the concerned SCell, see TS 36.213 [23]. clause 7.1.6.4. Values 1, 2, 3 are applicable when *dl-Bandwidth* for the concerned SCell is greater than 10 resource blocks, values 2, 3, 4 are applicable when *dl-Bandwidth* for the concerned SCell is less than or equal to 10 resource blocks, see TS 36.211 [21], Tables 6 and 7-1.

schedulingCellId

Indicates which cell signals the downlink allocations and uplink grants, if applicable, for the concerned SCell. In case the UE is configured with DC, the scheduling cell is part of the same cell group (i.e. MCG or SCG) as the scheduled cell. In case the UE is configured with *crossCarrierSchedulingConfigLAA-UL*, *schedulingCellId* indicated in *crossCarrierSchedulingConfigLAA-UL* only indicates which cell signals the uplink grants.

_

CSI-IM-Config

The IE *CSI-IM-Config* is the CSI Interference Measurement (IM) configuration that E-UTRAN may configure on a serving frequency, see TS 36.213 [23], clause 7.2.6.

CSI-IM-Config information elements

```
-- ASN1START
CSI-IM-Config-r11 ::=
                                SEQUENCE {
    Csi-IM-ConfigId-r11CSI-IM-ConfigId-r11,resourceConfig-r11INTEGER (0..31),subframeConfig-r11INTEGER (0..154),
    [[
         interferenceMeasRestriction-r13
                                                  BOOLEAN
                                                                 OPTIONAL
                                                                               -- Need ON
    11
}
CSI-IM-ConfigExt-r12 ::=
                                   SEQUENCE {
    csi-IM-ConfigId-v1250
resourceConfig-r12
subframeConfig-r12
                                      CSI-IM-ConfigId-v1250,
                                    INTEGER (0..31),
                                   INTEGER (0..154),
    subframeConfig-r12
    [[
       interferenceMeasRestriction-r13 BOOLEAN
                                                                     OPTIONAL, -- Need ON
         csi-IM-ConfigId-v1310 CSI-IM-ConfigId-v1310 OPTIONAL
                                                                                   -- Need ON
    11
}
```

-- ASN1STOP

CSI-IM-Config field descriptions resourceConfig Parameter: CSI reference signal configuration, see TS 36.213 [23], clause 7.2.6 and TS 36.211 [21], tables 6.10.5.2-1 and 6.10.5.2-2 for 4 REs. subframeConfig Parameter: I_{CSI-RS}, see TS 36.213 [23], clause 7.2.6 and TS 36.211 [21], table 6.10.5.3-1.

CSI-IM-ConfigId

The IE *CSI-IM-ConfigId* is used to identify a CSI-IM configuration that is configured by the IE *CSI-IM-Config.* The identity is unique within the scope of a carrier frequency.

CSI-IM-ConfigId information elements

```
CSI-IM-ConfigId-rl1 ::=INTEGER (1..maxCSI-IM-rl1)CSI-IM-ConfigId-rl2 ::=INTEGER (1..maxCSI-IM-rl2)CSI-IM-ConfigId-vl250 ::=INTEGER (maxCSI-IM-rl2)CSI-IM-ConfigId-vl310 ::=INTEGER (minCSI-IM-rl3..maxCSI-IM-rl3)CSI-IM-ConfigId-rl3 ::=INTEGER (1..maxCSI-IM-rl3)
```

-- ASN1STOP

-- ASN1START

CSI-Process

The IE CSI-Process is the CSI process configuration that E-UTRAN may configure on a serving frequency.

CSI-Process information elements

ASN1	START			
csi csi csi	-RS-ConfigNZPId-r11 CSI-RS- -IM-ConfigId-r11 CSI-IM-	cessId-r11, ConfigNZPId-r11, ConfigId-r11, CBSR-Pair-r13a,		
		ortBothProc-r11	OPTIONAL,	Need OR
		EGER (0maxCOI-ProcExt-r11)	OPTIONAL,	Need OR
	-ReportAperiodicProc-r11 CQI-Rep	· ~ /	OPTIONAL,	Need OR
Cqi	Keporekperiodierioe ili egi kep	orcaperiodicitoe iii	OI I I ONAL,	Need on
[['alternativeCodebookEnabledFor4T csi-IM-ConfigIdList-r12 CHO release	XProc-r12 ENUMERATED {true} ICE { NULL,	OPTIONAL,	Need ON
	setup	SEQUENCE (SIZE (12)) OF CSI-I	M-ConfigId-r12	
	}		OPTIONAL,	Need ON
	cqi-ReportAperiodicProc2-r12	CHOICE {		
	release	NULL,		
	setup	CQI-ReportAperiodicProc-r11		
	}		OPTIONAL	Need ON
]],				
[[cqi-ReportAperiodicProc-v1310 release	CHOICE { NULL,		
	setup	CQI-ReportAperiodicProc-v13	10	
	}		OPTIONAL,	Need ON
	cqi-ReportAperiodicProc2-v1310	CHOICE {		
	release	NULL,		
	setup	CQI-ReportAperiodicProc-v13	10	
	}		OPTIONAL,	Need ON
	eMIMO-Type-r13	CSI-RS-ConfigEMIMO-r13	OPTIONAL	Need ON
]],				
]]	dummy CSI-RS-Conf	igEMIMO-v1430 OPTIONAL,	Need ON	
	eMIMO-Hybrid-r14	CSI-RS-ConfigEMIMO-Hybrid-r14	OPTIONAL,	Need ON
	advancedCodebookEnabled-r14	BOOLEAN	OPTIONAL	Need ON
]],				
]]		CSI-RS-ConfigEMIMO-v1480	OPTIONAL	Need ON
)), [[BOOLEAN	OPTIONAL,	Need ON
]],	feCOMP-CSI-Enabled-v1530		OPTIONAL, OPTIONAL	Need ON Need ON
]], [[BOOLEAN CSI-RS-ConfigEMIMO-v1530		
]],	feCOMP-CSI-Enabled-v1530			

	CSI-Process field descriptions
advancedCodebookEnabled	
configure the field when the UE	JE should use the advanced code book defined in TS 36.213 [23]. EUTRAN does not is configured with <i>eMIMO-Type</i> is set to <i>beamformed</i> , when the UE is configured with is configured with <i>semiOpenLoop</i> .
alternativeCodebookEnabledl	
Indicates whether code book in feedback and reporting for a CS non-zero power transmission CS	TS 36.213 [23] Table 7.2.4-0A to Table 7.2.4-0D is being used for deriving CSI I process. EUTRAN may configure the field only if the number of CSI-RS ports for
applies for CSI subframe set 1. same frequency as the CSI proc	configured for the same frequency as the CSI process, <i>cqi-ReportAperiodicProc</i> If <i>csi-MeasSubframeSet1-r10</i> or <i>csi-MeasSubframeSet2-r10</i> are configured for the cess, <i>cqi-ReportAperiodicProc</i> applies for CSI subframe set 1 or CSI subframe set 2. <i>Proc</i> applies for all subframes. E-UTRAN configures <i>cqi-ReportAperiodicProc-v1310</i> <i>cr11</i> is configured
cqi-ReportAperiodicProc2	<u> </u>
cqi-ReportAperiodicProc2 is con CSI process. cqi-ReportAperiod cqi-ReportAperiodicProc2 the sa v1310 only if cqi-ReportAperiod	nfigured only if csi-MeasSubframeSets-r12 is configured for the same frequency as th licProc2 is for CSI subframe set 2. E-UTRAN shall set cqi-ReportModeAperiodic-r11 i ame as in cqi-ReportAperiodicProc. E-UTRAN configures cqi-ReportAperiodicProc2- icProc2-r12 is configured.
cqi-ReportBothProc	
	meters applicable for both aperiodic and periodic CSI reporting, for which CSI proces ed. E-UTRAN configures the field if and only if <i>cqi-ReportPeriodicProcId</i> is included oc is included.
cqi-ReportPeriodicProcId	
Refers to a periodic CQI reporting refers to the set of parameters of the set of the se	ng configuration that is configured for the same frequency as the CSI process. Value defined by the REL-10 CQI reporting configuration fields, while the other values refered JTRAN assigns by <i>CQI-ReportPeriodicProcExt-r11</i> (and as covered by <i>CQI-</i>
csi-IM-ConfigId	
Refers to a CSI-IM configuration	n that is configured for the same frequency as the CSI process. If <i>csi-IM-ConfigId</i> - is configured, the UE only considers this extension (i.e., UE ignores <i>csi-IM-ConfigId</i> -
csi-IM-ConfigIdList	
Refers to one or two CSI-IM co	nfigurations that are configured for the same frequency as the CSI process. <i>csi-IM</i> - es only if <i>csi-MeasSubframeSets-r12</i> is configured for the same frequency as the CSI
csi-RS-ConfigNZPId Refers to a CSI RS configuration CSI process.	n using non-zero power transmission that is configured for the same frequency as the
dummy	
This field is not used in the spec	cification. If received it shall be ignored by the UE.
used for deriving CSI feedback a and <i>beamformed</i> correspond to	S 36.213 [23], TS 36.211 [21]. If <i>eMIMO-Type</i> is set to <i>nonPrecoded</i> , the codebooks are in TS 36.213 [23], Table 7.2.4-10 to Table 7.2.4-17. Choice values <i>nonPrecoded</i> ' <i>CLASS A</i> ' and ' <i>CLASS B</i> ' respectively, see TS 36.212 [22] and TS 36.213 [23].
UTRAN only configures the field CSI-RS resources using the IE (configued with csi-RS-ConfigNZ	d, see TS 36.213 [23], clause 7.1.10. Refers to CSI feedback based on FeCoMP. E- d when the UE is configured with <i>eMIMO-Type-r13</i> set to <i>beamformed</i> with two <i>NZP</i> <i>CSI-RS-ConfigBeamformed-r13</i> which contains the two NZP CSI-RS reources <i>CPIdListExt-r13</i> .
	BSRList-r11 if configured with eMIMO-Type unless it is set to beamformed, amformed (in CSI-RS-ConfigBeamformed) is set to FALSE and csi-RS- gured,

CSI-ProcessId

—

The IE *CSI-ProcessId* is used to identify a CSI process that is configured by the IE *CSI-Process*. The identity is unique within the scope of a carrier frequency.

CSI-ProcessId information elements

ASN1START		
CSI-ProcessId-r11 ::=	INTEGER (1maxCSI-Proc-r11)	

-- ASN1STOP

CSI-RS-Config

The IE CSI-RS-Config is used to specify the CSI (Channel-State Information) reference signal configuration.

CSI-RS-Config information elements

-- ASN1START CSI-RS-Config-r10 ::= SEQUENCE { csi-RS-r10 CHOICE { NULL, release SEQUENCE { setup antennaPortsCount-r10 resourceConfig-r10 subframeConfig-r10 ENUMERATED {an1, an2, an4, an8}, INTEGER (0..31), INTEGER (0..154), INTEGER (-8..15) p-C-r10 } OPTIONAL, -- Need ON } -- Need ON zeroTxPowerCSI-RS-r10 ZeroTxPowerCSI-RS-Conf-r12 OPTIONAL } CSI-RS-Config-v1250 ::= SEQUENCE { zeroTxPowerCSI-RS2-r12 ZeroTx1 zeroTxPowerCSI-RS2-r12 ZeroTxPowerCSI-RS-Conf-r12 OPTIONAL, ds-ZeroTxPowerCSI-RS-r12 CHOICE { -- Need ON CHOICE { release NULL setup SEQUENCE { zeroTxPowerCSI-RS-List-r12 SEQUENCE (SIZE (1..maxDS-ZTP-CSI-RS-r12)) OF ZeroTxPowerCSI-RS-r12 } } OPTIONAL -- Need ON } CSI-RS-Config-v1310 ::= SEQUENCE { eMIMO-Type-r13 CSI-RS-ConfigEMIMO-r13 OPTIONAL -- Need ON } CSI-RS-Config-v1430 ::= SEQUENCE { eMIMO-Hybrid-r14 OPTIONAL, OPTIONAL, -- Need ON CSI-RS-ConfigEMIMO-v1430 -- Need ON CSI-RS-ConfigEMIMO-Hybrid-r14 -- Need ON advancedCodebookEnabled-r14 BOOLEAN OPTIONAL } CSI-RS-Config-v1480 ::= SEQUENCE { eMIMO-Type-v1480 CSI-RS-ConfigEMIMO-v1480 OPTIONAL -- Need ON } CSI-RS-Config-v1530 ::= SEQUENCE { eMIMO-Type-v1530 CS CSI-RS-ConfigEMIMO-v1530 eMIMO-Type-v1530 OPTIONAL -- Need ON } CSI-RS-Config-r15 ::= CHOICE { release NULL, csi-RS-Config-r10 csi-PS Config-r10 CSi-RS-Config-r10CSI-RS-Config-r10OPTIONAL,--csi-RS-Config-v1250CSI-RS-Config-v1250OPTIONAL,--Need ONcsi-RS-Config-v1310CSI-RS-Config-v1310OPTIONAL,--Need ONcsi-RS-Config-v1430CSI-RS-Config-v1430OPTIONAL--Need ON setup -- Need ON } } ZeroTxPowerCSI-RS-Conf-r12 ::= CHOICE { NULL, release ZeroTxPowerCSI-RS-r12 setup } ZeroTxPowerCSI-RS-r12 ::= SEQUENCE { zeroTxPowerCost Ro 112 zeroTxPowerResourceConfigList-r12 zeroTxPowerSubframeConfig-r12 INTEGER (0..154) BIT STRING (SIZE (16)), } -- ASN1STOP

CSI-RS-Config field descriptions
advancedCodebookEnabled
Value TRUE indicates that the UE should use the advanced code book defined in TS 36.213 [23]. EUTRAN does not configure the field when the UE is configured with <i>eMIMO-Type</i> is set to <i>beamformed</i> , when the UE is configured with <i>eMIMO-Hybrid</i> or when the UE is configured with <i>semiOpenLoop</i> .
antennaPortsCount
Parameter represents the number of antenna ports used for transmission of CSI reference signals where value an1 corresponds to 1 antenna port, an2 to 2 antenna ports and so on, see TS 36.211 [21], clause 6.10.5.
ds-ZeroTxPowerCSI-RS
Parameter for additional zeroTxPowerCSI-RS for a serving cell, concerning the CSI-RS included in discovery signals.
dummy
This field is not used in the specification. If received it shall be ignored by the UE.
еМІМО-Туре
Parameter: eMIMO-Type, see TS 36.213 [23], TS 36.211 [21]. If eMIMO-Type is set to nonPrecoded, the codebooks
used for deriving CSI feedback are in TS 36.213 [23], Table 7.2.4-10 to Table 7.2.4-17. Choice values <i>nonPrecoded</i> and <i>beamformed</i> correspond to ' <i>CLASS A</i> ' and ' <i>CLASS B</i> ' respectively, see TS 36.212 [22] and TS 36.213 [23].
p-C
Parameter: P _c , see TS 36.213 [23], clause 7.2.5. The UE shall ignore p-C-r10 if configured with eMIMO-Type unless
it is set to <i>beamformed</i> , <i>alternativeCodebookEnabledBeamformed</i> (in CSI-RS-ConfigBeamformed) is set to FALSE and csi-RS-ConfigNZPIdListExt is not configured.
resourceConfig
Parameter: CSI reference signal configuration, see TS 36.211 [21], tables 6.10.5.2-1 and 6.10.5.2-2.
subframeConfig
Parameter: I _{CSI-RS} , see TS 36.211 [21], table 6.10.5.3-1.
zeroTxPowerCSI-RS2
Parameter for additional zeroTxPowerCSI-RS for a serving cell. E-UTRAN configures the field only if csi-
MeasSubframeSets-r12 and TM 1 – 9 are configured for the serving cell.
zeroTxPowerResourceConfigList
Parameter: ZeroPowerCSI-RS, see TS 36.213 [23], clause 7.2.7.
zeroTxPowerSubframeConfig
Parameter: <i>I</i> _{CSI-RS} , see TS 36.211 [21], table 6.10.5.3-1.

CSI-RS-ConfigBeamformed

The IE CSI-RS-ConfigBeamformed is used to specify the beamforming configuration of EBF/ FD-MIMO.

CSI-RS-ConfigBeamformed information elements

i	ASN1START					
~~~		(				
CSI		NCE {			c	-
		EQUENCE (SIZE	(17))	OF CSI-RS-Co	ntigNZPId-rl:	3
	OPTIONAL, Need OR					
	5	EQUENCE (SIZE	(18))	OF CSI-IM-Co	nfigId-r13	
	OPTIONAL, Need OR					
		EQUENCE (SIZE	(18))	OF P-C-AndCB	SR-Pair-r13	
	OPTIONAL, Need OR					
	ace-For4Tx-PerResourceConfigList-r13 SH	EQUENCE (SIZE	(17))	OF BOOLEAN	OPTIONAL,	Need
OR						
	alternativeCodebookEnabledBeamformed-r13			OPTIONAL,		
	channelMeasRestriction-r13 EN	NUMERATED {on}		OPTIONAL	Need OR	
}						
		,				
CSI	I-RS-ConfigBeamformed-r14 ::= SEQUENCE {	•				
		EQUENCE (SIZE	(17))	OF CSI-RS-Co	nfigNZPId-r1	3
	OPTIONAL, Need OR					
		EQUENCE (SIZE	(18))	OF CSI-IM-Co	nfigId-r13	
	OPTIONAL, Need OR					
		EQUENCE (SIZE	(18))	OF P-C-AndCB	SR-Pair-r13	
	OPTIONAL, Need OR					
	ace-For4Tx-PerResourceConfigList-r14 SH	EQUENCE (SIZE	(17))	OF BOOLEAN	OPTIONAL,	Need
OR						
	alternativeCodebookEnabledBeamformed-r14			OPTIONAL,		
	channelMeasRestriction-r14 EN					
	csi-RS-ConfigNZP-ApList-r14 SH	EQUENCE (SIZE	(18))		-	
				OPT	IONAL, 1	Need OR
	nzp-ResourceConfigOriginal-v1430 CSI-RS	S-Config-NZP-v		OPTIONAL,		

```
csi-RS-NZP-Activation-r14 CSI-RS-ConfigNZP-Activation-r14 OPTIONAL -- Need
OR
}
CSI-RS-ConfigBeamformed-v1430::= SEQUENCE {
csi-RS-ConfigNZP-ApList-r14 SEQUENCE
                                                SEQUENCE (SIZE (1..8)) OF CSI-RS-ConfigNZP-r11
    nzp-ResourceConfigOriginal-v1430 CSI-RS-Config-NZP-v1430 OPTIONAL, -- Need OR
csi-RS-NZP-Activation-r14 CSI-RS-ConfigNZP-Activation-r14 OPTIONAL
                                                                                                                  -- Need
OR
}
CSI-RS-Config-NZP-v1430::=
                                     SEQUENCE {
                                                      NZP-TransmissionComb-r14 OPTIONAL, -- Need OR
NZP-FrequencyDensity-r14 OPTIONAL -- Need OR
     transmissionComb-r14
    frequencyDensity-r14
}
CSI-RS-ConfigNZP-Activation-r14::= SEQUENCE {
csi-RS-NZP-mode-r14 ENUMER
activatedResources-r14 INTEGE
                                                     ENUMERATED {semiPersistent, aperiodic},
                                                      INTEGER (0..4)
}
-- ASN1STOP
```

	CSI-RS-ConfigBeamformed field descriptions
	-For4Tx-PerResourceConfigList field indicates the alternativeCodeBookEnabledFor4TX-r12 per CSI-RS resource. E-UTRAN configures the field
only	if csi-RS-ConfigNZPIdListExt is configured.
	vatedResources
sem conf	number of activated CSI-RS resources, which concerns a subset of the aperiodic CSI-RS resources (for both i-persistent and aperiodic mode). E-UTRAN configures at most the minimum between <i>nMaxResource</i> as igured by <i>MIMO-UE-ParametersPerTM-r1430</i> and the number of resources as configured by <i>csi-RS-ConfigNZP-istant</i> .
	ist-r14.
The CSI RS ( conf	<i>rnativeCodebookEnabledBeamformed</i> field indicates whether code book in TS 36.213 [23], Table 7.2.4-18 to Table 7.2.4-20, is being used for deriving feedback and reporting for a CSI process. E-UTRAN configures the field only for a process referring to a single configuration using non-zero power transmission (i.e a process for which <i>csi-RS-ConfigNZPIdListExt</i> is not figured). Field <i>alternativeCodebookEnabledBeamformed</i> corresponds to parameter mativeCodebookEnabledCLASSB_K1 in TS 36.212 [22] and TS 36.213 [23].
	IM-ConfigIdList
E-U	TRAN configures the field <i>csi-IM-ConfigIdList</i> only if the IE is included in CSI-Process is configured (i.e. when 0 is configured for the serving cell).
	-RS-ConfigBeamformed
If cs	<i>i-RS-ConfigNZPIdListExt-r13</i> is configured, E-UTRAN configures the same total number of entries for NZP, <i>csi-</i> <i>ConfigIdList-r13</i> and <i>p-C-AndCBSR-PerResourceConfigList-r13</i> .
csi-	RS-ConfigNZP-ApList
cont whic For <i>RS-</i> conf	field is used to configure NZP configurations for aperiodic or semi-persistent CSI RS reporting for which MAC rols activation. EUTRAN configures this field only when the UE is configured to use 2, 4 or and 8 ports CSI-RS, in the case EUTRAN configures the number of entries to be the same as the number of NZP resource configurations all these entries the UE shall ignore field <i>subframeConfig</i> . EUTRAN always configures this field together with <i>csi-NZP-Activation</i> . Furthermore, for a given process, E-UTRAN does not simultaneously configure the periodic NZP regulation (S) and NZP CSI RS configurations for aperiodic or semi-persistent reporting.
	RS-ConfigNZP-EMIMO
	field is used to configure NZP configurations additional to the one defined by the original NZP configuration as uded in CSI-RS-Config/ CSI-Process when using 12 and 16 ports CSI-RS.
	RS-ConfigNZPIdListExt (in CSI-RS-ConfigBeamformed)
or c	cates the NZP configuration(s)in addition to the original NZP configuration, as defined by csi-RS-Config-r10 (TM9 si-RS-ConfigNZPId-r11 (TM10). I.e. extends the size of the NZP configuration list (originally a single entry i.e. list
	ze 1) using the general principles specified in 5.1.2.
	-AndCBSR-PerResourceConfigList
	TRAN does not configure the field <i>p</i> - <i>C</i> - <i>AndCBSR</i> - <i>PerResourceConfigList</i> if the UE is configured with <i>eMIMO</i> -
	e set to beamformed, alternativeCodebookEnabledBeamformed is set to FALSE and csi-RS-ConfigNZPIdListExt
is no	ot configured.

# CSI-RS-ConfigEMIMO

The IE *CSI-RS-ConfigEMIMO* is used to specify the CSI (Channel-State Information) reference signal configuration for EBF/ FD-MIMO.

CSI-RS-ConfigEMIMO information elements

```
-- ASN1START
CSI-RS-ConfigEMIMO-r13 ::= CHOICE {
    release
                                NULL,
                                CHOICE {
    setup
        nonPrecoded-r13
beamformed-r13
                                    CSI-RS-ConfigNonPrecoded-r13,
        beamformed-r13
                                     CSI-RS-ConfigBeamformed-r13
    }
}
CSI-RS-ConfigEMIMO-v1430 ::=
                                CHOICE {
    release
                                 NULL,
    setup
                                CHOICE {
        nonPrecoded-v1430
                                         CSI-RS-ConfigNonPrecoded-v1430,
                                         CSI-RS-ConfigBeamformed-v1430
        beamformed-v1430
    }
}
CSI-RS-ConfigEMIMO-v1480 ::=
                                CHOICE {
    release
                                NULL,
                                 CHOICE {
    setup
        nonPrecoded-v1480
                                         CSI-RS-ConfigNonPrecoded-v1480,
        beamformed-v1480
                                         CSI-RS-ConfigBeamformed-v1430
    }
}
CSI-RS-ConfigEMIMO-v1530 ::=
                                CHOICE {
                                 NULL.
   release
                                 CHOICE {
    setup
        nonPrecoded-v1530
                                         CSI-RS-ConfigNonPrecoded-v1530
}
CSI-RS-ConfigEMIMO2-r14 ::= CHOICE {
    release
                                NULL .
                                 CSI-RS-ConfigBeamformed-r14
    setup
}
CSI-RS-ConfigEMIMO-Hybrid-r14 ::= CHOICE {
   release
                                NULL,
                                SEQUENCE {
    setup
        periodicityOffsetIndex-r14
                                             INTEGER (0..1023)
                                             INTEGER (0..1023) OPTIO
CSI-RS-ConfigEMIMO2-r14 OPTIONAL
                                                                              OPTIONAL,
                                                                                          -- Need OR
        eMIMO-Type2-r14
                                                                                     -- Need ON
    }
}
```

-- ASN1STOP

#### CSI-RS-ConfigEMIMO field descriptions

*periodicityOffsetIndex* This parameter is associated with the first EMIMO configuration of the hybrid eMIMO configuration.

### CSI-RS-ConfigNonPrecoded

The IE CSI-RS-ConfigNonPrecoded is used to specify the non-precoded EBF/ FD-MIMO configuration.

```
-- ASN1START
CSI-RS-ConfigNonPrecoded-r13 ::=
                                         SEQUENCE {
   p-C-AndCBSRList-r13
                                             P-C-AndCBSR-Pair-r13
                                                                              OPTIONAL,
                                                                                          -- Need OR
    codebookConfigN1-r13
                                            ENUMERATED {n1, n2, n3, n4, n8},
                                            ENUMERATED \{n1, n2, n3, n4, n8\},
ENUMERATED \{n4, n8\}
    codebookConfigN2-r13
    codebookOverSamplingRateConfig-01-r13
                                                                             OPTIONAL,
                                                                                          -- Need OR
    codebookOverSamplingRateConfig-O2-r13 ENUMERATED {n4, n8}
                                                                             OPTIONAL,
                                                                                          -- Need OR
    codebookConfig-r13
                                            INTEGER (1..4),
    csi-IM-ConfigIdList-r13
                                            SEQUENCE (SIZE (1..2)) OF CSI-IM-ConfigId-r13
    OPTIONAL, -- Need OR
    csi-RS-ConfigNZP-EMIMO-r13
                                            CSI-RS-ConfigNZP-EMIMO-r13 OPTIONAL -- Need ON
```

,				
<pre>CSI-RS-ConfigNonPrecoded-v1430::= SEQ csi-RS-ConfigNZP-EMIMO-v1430 codebookConfigN1-v1430 codebookConfigN2-v1430 nzp-ResourceConfigTM9-Original-v1430 }</pre>	<pre>UUENCE {     CSI-RS-ConfigNZP-EMIMO-v1430     ENUMERATED {n5, n6, n7, n10, n1     ENUMERATED {n5, n6, n7},     CSI-RS-Config-NZP-v1430</pre>		Need ON	
CSI-RS-ConfigNonPrecoded-v1480::= SEQ csi-RS-ConfigNZP-EMIMO-v1480 codebookConfigN1-v1480 OPTIONAL, Need OR codebookConfigN2-r1480 nzp-ResourceConfigTM9-Original-v1480 }	QUENCE { CSI-RS-ConfigNZP-EMIMO-v1430 ENUMERATED {n5, n6, n7, n10, n1 ENUMERATED {n5, n6, n7} CSI-RS-Config-NZP-v1430	12, n14, n16}	Need ON Need OR	
CSI-RS-ConfigNonPrecoded-v1530 ::= p-C-AndCBSRList-r15 }	SEQUENCE { P-C-AndCBSR-Pair-r15	OPTIONAL	Need OR	

-- ASN1STOP

}

CSI-RS-ConfigNonPrecoded field descriptions

codebookConfig
ndicates a sub-set of the codebook entry, see TS 36.213 [23].
codebookConfigNx
ndicates the number of antenna ports per polarization in dimension x as used for transmission of CSI reference signals. Value n1 corresponds to 1, value n2 corresponds to 2 and so on, see TS 36.213 [23]. E-UTRAN configures he field in accordance with the restrictions as specified in TS 36.213 [23]. If <i>codebookConfigNx</i> in <i>CSI-RS-</i> <i>ConfigNonPrecoded-v1480</i> is configured, the UE shall ignore the field <i>codebookConfigNx</i> in <i>CSI-RS-</i>
ConfigNonPrecoded-V1480 is configured, the DE shall ignore the field codebookConfigNx in CSI-RS- ConfigNonPrecoded-r13.
codebookOverSamplingRateConfig-Ox
ndicates the spatial over-sampling rate in dimension x as used for transmission of CSI reference signals. Value n4 corresponds to 4 and value n8 corresponds to 8, see TS 36.213 [23].
csi-IM-Configld(List)
E-UTRAN configures the field <i>csi-IM-ConfigIdList</i> only if the IE is included in CSI-Process is configured (i.e. when TM10 is configured for the serving cell).
csi-RS-ConfigNZP-EMIMO
The field is used to configure NZP configurations additional to the one defined by the original NZP configuration as ncluded in <i>CSI-RS-Config/ CSI-Process</i> when using more than 8 ports CSI-RS as defined in TS 36.211 [21], table 5.10.5-1.

_

# CSI-RS-ConfigNZP

The IE *CSI-RS-ConfigNZP* is the CSI-RS resource configuration using non-zero power transmission that E-UTRAN may configure on a serving frequency.

### CSI-RS-ConfigNZP information elements

ASN1START			
CSI-RS-ConfigNZP-rll ::= SEQ csi-RS-ConfigNZPId-rll antennaPortsCount-rll resourceConfig-rll subframeConfig-rll scramblingIdentity-rll qcl-CRS-Info-rll qcl-ScramblingIdentity-rll crs-PortsCount-rll mbsfn-SubframeConfigList-rl release	<pre>UENCE {    CSI-RS-ConfigNZPId-r11,    ENUMERATED {an1, an2, an4, an8},    INTEGER (031),    INTEGER (0154),    INTEGER (0503),    SEQUENCE {         INTEGER (0503),         ENUMERATED {n1, n2, n4, spare1         CHOICE {             NULL,         }         CHOICE {             NULL         }         CHOICE         }         CHOICE         {             NULL         }         CHOICE         }         CHOICE         {             NULL         }         CHOICE         }         CHOICE         {             NULL         }         CHOICE         }</pre>	},	
setup	SEQUENCE {		
subframeConfigL	ist MBSFN-SubframeConfigLi	.st	
}		OPTIONAL OPTIONAL,	Need ON Need OR
[[ csi-RS-ConfigNZPId-v1310	CSI-RS-ConfigNZPId-v1310	OPTIONAL	Need ON

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```
]],
        frequencyDensity-r14
                                      NZP-TransmissionComb-r14 OPTIONAL,
NZP-FrequencyDensity-r14 OPTIONAL
    [[ transmissionComb-r14
                                                                        OPTIONAL,
                                                                                     -- Need OR
                                                                                     -- Need OR
    ]],
    [[ mbsfn-SubframeConfigList-v1430 CHOICE {
               release NULL,
                                            SEQUENCE {
                setup
                    subframeConfigList-v1430
                                              MBSFN-SubframeConfigList-v1430
                }
        }
                                                                         OPTIONAL
                                                                                     -- Need OP
    ]]
}
CSI-RS-ConfigNZP-EMIMO-r13 ::= CHOICE {
   release
                                NULL,
                               SEQUENCE {
    setup
                                     SEQUENCE (SIZE (1..2)) OF NZP-ResourceConfig-r13,
        nzp-resourceConfigList-r13
        cdmType-r13
                                       ENUMERATED {cdm2, cdm4} OPTIONAL -- Need OR
        }
}
CSI-RS-ConfigNZP-EMIMO-v1430 ::= SEQUENCE {
    -- All extensions are for Non-Precoded so could be grouped by setup/ release choice
   nzp-resourceConfigListExt-r14 SEQUENCE (SIZE (0..4)) OF NZP-ResourceConfig-r13,
cdmType-v1430 ENUMERATED {cdm8 } OPTIONAL -- Need OF
                                                          OPTIONAL -- Need OR
}
NZP-ResourceConfig-r13 ::= SEQUENCE {
    resourceConfig-r13
                            ResourceConfig-r13,
    [[ transmissionComb-r14NZP-TransmissionComb-r14frequencyDensity-r14NZP-FrequencyDensity-r14
                                                                    OPTIONAL, -- Need OR
                                                                    OPTIONAL -- Need OR
    ]]
}
ResourceConfig-r13 ::=
                                   INTEGER (0..31)
NZP-FrequencyDensity-r14 ::=
NZP-TransmissionComb-r14 ::=
                                        INTEGER (0..2)
                                      ENUMERATED {d1, d2, d3}
```

-- ASN1STOP

### CSI-RS-ConfigNZP field descriptions

CSI-RS-ConfigNZP field descriptions
antennaPortsCount
Parameter represents the number of antenna ports used for transmission of CSI reference signals where an1
corresponds to 1, an2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.10.5.
cdmType
Parameter: CDMType, see TS 36.211 [21], clause 6.10.5.2.
csi-RS-ConfigNZPId
Refers to a CSI RS configuration using non-zero power transmission that is configured for the same frequency as the CSI process. UE shall ignore CSI-RS-ConfigNZPId-r11 if CSI-RS-ConfigNZPId-v1310 is signalled.
frequencyDensity
Indicates the frequency-domain density reduction. E-UTRAN configures the values in accordance with the restrictions specified in TS 36.213 [23].
mbsfn-SubframeConfigList
Indicates the MBSFN configuration for the CSI-RS resources. If <i>qcI-CRS-Info-r11</i> is absent, the field is released.
nzp-resourceConfigList
Indicate a list of non-zero power transmission CSI-RS resources using parameter resourceConfig.
qcI-CRS-Info
Indicates CRS antenna ports that is quasi co-located with the CSI-RS antenna ports, see TS 36.213 [23], clause 7.2.5. EUTRAN configures this field if and only if the UE is configured with <i>qcl-Operation</i> set to <i>typeB</i> .
resourceConfig
Parameter: CSI reference signal configuration, see TS 36.211 [21], table 6.10.5.2-1 and 6.10.5.2-2.
subframeConfig
Parameter: <i>I</i> _{CSI-RS} , see TS 36.211 [21], table 6.10.5.3-1.
scramblingIdentity
Parameter: Pseudo-random sequence generator parameter, $n_{ m ID}$ , see TS 36.213 [23], clause 7.2.5.
transmissionComb
Indicates the transmission combining offset. E-UTRAN configures the values in accordance with the restrictions specified in TS 36.213 [23].

### CSI-RS-ConfigNZPId

The IE *CSI-RS-ConfigNZPId* is used to identify a CSI-RS resource configuration using non-zero transmission power, as configured by the IE *CSI-RS-ConfigNZP*. The identity is unique within the scope of a carrier frequency.

#### CSI-RS-ConfigNZPId information elements

CSI-RS-ConfigNZPId-r11 ::=	INTEGER (1maxCSI-RS-NZP-r11)
CSI-RS-ConfigNZPId-v1310 ::=	INTEGER (minCSI-RS-NZP-r13maxCSI-RS-NZP-r13)
CSI-RS-ConfigNZPId-r13 ::=	INTEGER (1maxCSI-RS-NZP-r13)

-- ASN1STOP

-- ASN1START

-- ASN1START

### – CSI-RS-ConfigZP

The IE *CSI-RS-ConfigZP* is the CSI-RS resource configuration, for which UE assumes zero transmission power, that E-UTRAN may configure on a serving frequency.

### CSI-RS-ConfigZP information elements

-- ASN1STOP

#### CSI-RS-ConfigZP field descriptions

 CSI-RS-ConfigZP-ApList

 Indicates the aperiodic zero power CSI-RS present in a given subframe. See 36.213 [23], Table 7.1.9-2. First entry in the list corresponds to aperiodic trigger 01 and so on.

 resourceConfigList

 Parameter: ZeroPowerCSI-RS, see TS 36.213 [23], clause 7.2.7.

 subframeConfig

 Parameter: I_{CSI-RS}, see TS 36.211 [21], table 6.10.5.3-1.

### CSI-RS-ConfigZPId

The IE *CSI-RS-ConfigZPId* is used to identify a CSI-RS resource configuration for which UE assumes zero transmission power, as configured by the IE *CSI-RS-ConfigZP*. The identity is unique within the scope of a carrier frequency.

### CSI-RS-ConfigZPId information elements

-- ASN1START

CSI-RS-ConfigZPId-r11 ::= INTEGER (1..maxCSI-RS-ZP-r11)

-- ASN1STOP

### DataInactivityTimer

The IE *DataInactivityTimer* is used to control Data inactivity operation. Corresponds to the timer for data inactivity monitoring in TS 36.321 [6]. Value s1 corresponds to 1 second, s2 corresponds to 2 seconds and so on.

#### DataInactivityTimer information element

ASN1START	
DataInactivityTimer-r14 ::=	ENUMERATED { s1, s2, s3, s5, s7, s10, s15, s20, s40, s50, s60, s80, s100, s120, s150, s180}
ASN1STOP	

DMRS-Config

The IE DMRS-Config is the DMRS configuration that E-UTRAN may configure on a serving frequency.

### **DMRS-Config** information elements

```
-- ASN1START

DMRS-Config-rl1 ::= CHOICE {

   release NULL,

   setup SEQUENCE {

      scramblingIdentity-rl1 INTEGER (0..503),

      scramblingIdentity2-rl1 INTEGER (0..503)

   }

}

DMRS-Config-v1310 ::= SEQUENCE {

   dmrs-tableAlt-rl3 ENUMERATED {true} OPTIONAL -- Need OR

}

-- ASN1STOP
```

DMRS-Config field descriptions	
scramblingIdentity, scramblingIdentity2	
"DMRS,i	
Parameter: $n_{\rm ID}^{\rm DMB, 4}$ , see TS 36.211 [21], clause 6.10.3.1.	
dmrs-tableAlt	
The field indicates whether to use an alternative table for DMRS upon PDSCH transmission, see TS 36.213 [23].	

DRB-Identity

The IE DRB-Identity is used to identify a DRB used by a UE.

### **DRB-Identity** information elements

```
-- ASN1START
DRB-Identity ::=
```

INTEGER (1..32)

-- ASN1STOP

### – EPDCCH-Config

The IE EPDCCH-Config specifies the subframes and resource blocks for EPDCCH monitoring that E-UTRAN may configure for a serving cell.

### EPDCCH-Config information element

-- ASN1START

```
EPDCCH-Config-r11 ::=
                            SEQUENCE {
    config-r11 CHOICE {
         release
                                         NULL,
                                         SEOUENCE {
         setup
             subframePatternConfig-r11 CHOICE {
                                               NULL,
                 release
                                                  SEOUENCE {
                  setup
                       subframePattern-r11
                                                       MeasSubframePattern-r10
                  }
              }
                                                                                        OPTIONAL, -- Need ON
             startSymbol-r11INTEGER (1..4)OPTIONAL, -- Need OPsetConfigToReleaseList-r11EPDCCH-SetConfigToReleaseList-r11OPTIONAL, -- Need ONsetConfigToAddModList-r11EPDCCH-SetConfigToAddModList-r11OPTIONAL -- Need ON
         }
    }
}
EPDCCH-SetConfigToAddModList-r11 ::= SEQUENCE (SIZE(1..maxEPDCCH-Set-r11)) OF EPDCCH-SetConfig-r11
EPDCCH-SetConfigToReleaseList-r11 ::= SEQUENCE (SIZE(1..maxEPDCCH-Set-r11)) OF EPDCCH-SetConfigId-
r11
EPDCCH-SetConfig-r11 ::=
                                    SEQUENCE {
                                        EPDCCH-SetConfigId-r11,
    setConfigId-r11
                                         ENUMERATED {localised, distributed},
    transmissionType-r11
    resourceBlockAssignment-r11 SEQUENCE{
         numberPRB-Pairs-r11 ENUMERATED {n2, n4, n8},
resourceBlockAssignment-r11 BIT STRING (SIZE(4..38))
        numberPRB-Pairs-r11
    },
    dmrs-ScramblingSequenceInt-r11INTEGER (0..503),pucch-ResourceStartOffset-r11INTEGER (0..2047),re-MappingQCL-ConfigId-r11PDSCH-RE-MappingQCL-ConfigId-r11OPTIONAL, -- Need OR
    [[ csi-RS-ConfigZPId2-r12 CHOICE {
             release
                                                   NULL,
             setup
                                                   CSI-RS-ConfigZPId-r11
         }
                                                                              OPTIONAL
                                                                                            -- Need ON
    ]],
    [[ numberPRB-Pairs-v1310
                                              CHOICE {
                                                  NULL,
             release
             setup
                                                   ENUMERATED {n6}
         }
                                                                              OPTIONAL,
                                                                                            -- Need ON
                                              CHOICE {
         mpdcch-config-r13
             release
                                                  NULL,
                                                  SEQUENCE {
             setup
                  csi-NumRepetitionCE-r13
                                                       ENUMERATED {sf1, sf2, sf4, sf8, sf16, sf32},
                  mpdcch-pdsch-HoppingConfig-r13 ENUMERATED {on,off},
                  mpdcch-StartSF-UESS-r13
                                                      CHOICE {
                       fdd-r13
                                                            ENUMERATED {v1, v1dot5, v2, v2dot5, v4,
                                                           v5, v8, v10},
ENUMERATED {v1, v2, v4, v5, v8, v10,
v20, spare1}
                       tdd-r13
                  },
                  mpdcch-NumRepetition-r13
                                                       ENUMERATED {r1, r2, r4, r8, r16,
                                                                     r32, r64, r128, r256},
                                                       INTEGER (1.. maxAvailNarrowBands-r13)
                  mpdcch-Narrowband-r13
             }
         }
                                                                              OPTIONAL
                                                                                            -- Need ON
    ]]
}
EPDCCH-SetConfigId-r11 ::= INTEGER (0..1)
-- ASN1STOP
```

EPDCCH-Config field descriptions	
si-NumRepetitionCE	
lumber of subframes for CSI reference resource, see TS 36.213 [23]. Value sf1 corresponds to 1 subframe or responds to 2 subframes and so on.	e, sf2
esi-RS-ConfigZPId2	
ndicates the rate matching parameters in addition to those indicated by <i>re-MappingQCL-ConfigId</i> . E-UTRA configures this field only when tm10 is configured.	N
Imrs-ScramblingSequenceInt	
The DMRS scrambling sequence initialization parameter $n_{\text{ID},i}^{\text{EPDCCH}}$ or $n_{\text{ID},i}^{\text{MPDCCH}}$ defined in TS 36.211 [21],	clause
5.10.3A.1.	
EPDCCH-SetConfig	
Provides EPDCCH configuration set. See TS 36.213 [23], clause 9.1.4. E-UTRAN configures at least one <i>E</i> SetConfig when EPDCCH-Config is configured. For BL UEs or UEs in CE, EUTRAN does not configure mo one EPDCCH-SetConfig.	
npdcch-Narrowband	
Parameter: 1, see TS 36.211 [21], clause 6.8B.5. Field values (1 <i>maxAvailNarrowBands-r13</i> ) correspon	nd to
arrowband indices (0[maxAvailNarrowBands-r13-1]) as specified in TS 36.211 [21].	
npdcch-NumRepetition	
Aximum numbers of repetitions for UE-SS for MPDCCH, see TS 36.211 [21].	
npdcch-pdsch-HoppingConfig	
requency hopping activation/deactivation for unicast MPDCCH/PDSCH, see TS 36.211 [21]. E-UTRAN do onfigure the value on if freqHoppingParametersDL is not present in SystemInformationBlockType1.	es not
npdcch-StartSF-UESS	
Starting subframe configuration for an MPDCCH UE-specific search space, see TS 36.211 [21]. Value v1 co	orresponds
p 1, value v1dot5 corresponds to 1.5, and so on.	
numberPRB-Pairs	
ndicates the number of physical resource-block pairs used for the EPDCCH set. Value n2 corresponds to 2 esource-block pairs; n4 corresponds to 4 physical resource-block pairs and so on. Value n8 is not supporte <i>Bandwidth</i> is set to 6 resource blocks. EUTRAN configures value up to n6 only for BL UEs or UEs in CE. Value has a pair and so on the set of the set o	ed if <i>dl-</i>
nly applicable to BL UEs or UEs in CE .	
bucch-ResourceStartOffset	
PUCCH format 1a, 1b and 3 resource starting offset for the EPDCCH set. See TS 36.213 [23], clause 10.1.	
e-MappingQCL-Configld	
ndicates the starting OFDM symbol, the related rate matching parameters and quasi co-location assumptio	
EPDCCH when the UE is configured with tm10. This field provides the identity of a configured PDSCH-RE-	
MappingQCL-Config. E-UTRAN configures this field only when tm10 is configured.	
esourceBlockAssignment ndicates the index to a specific combination of physical resource-block pair for EPDCCH set. See TS 36.21 lause 9.1.4.4. The size of resourceBlockAssignment is specified in TS 36.213 [23], clause 9.1.4.4, and bas	sed on
numberPRB-Pairs and the signalled value of <i>dl-Bandwidth</i> . If <i>numberPRB-Pairs-v1310</i> field is present, the to number of physical resource-block pairs is 6 and it is composed of one subset of 2 physical resource-block nother subset of 4 physical resource-block pairs, and the <i>resourceBlockAssignment</i> field defines the subset of 4 physical resource-block pairs.	pairs and
hysical resource-block pairs.	
setConfigId	
ndicates the identity of the EPDCCH configuration set.	
startSymbol	
ndicates the OFDM starting symbol for any EPDCCH and PDSCH scheduled by EPDCCH on the same cell	
6.213 [23], clause 9.1.4.1. If not present, the UE shall release the configuration and shall derive the startin	
ymbol of EPDCCH and PDSCH scheduled by EPDCCH from PCFICH. Values 1, 2, and 3 are applicable for Bandwidth greater than 10 resource blocks. Values 2, 3, and 4 are applicable otherwise. E-UTRAN does not be finded for USE and for the test of t	
he field for UEs configured with tm10.	
subframePatternConfig Configures the subframes which the UE shall monitor the UE-specific search space on EPDCCH, except fo lefined rules in TS 36.213 [23], clause 9.1.4. If the field is not configured when EPDCCH is configured, the nonitor the UE-specific search space on EPDCCH in all subframes except for pre-defined rules in TS 36.21	UE shall
lause 9.1.4.	
<i>ransmissionType</i> ndicates whether distributed or localized EPDCCH transmission mode is used as defined in TS 36.211 [21]	], clause
5.8A.1.	-

### EIMTA-MainConfig

The IE *EIMTA-MainConfig* is used to specify the eIMTA-RNTI used for eIMTA and the subframes used for monitoring PDCCH with eIMTA-RNTI. The IE *EIMTA-MainConfigServCell* is used to specify the eIMTA related parameters applicable for the concerned serving cell.

#### EIMTA-MainConfig information element

```
-- ASN1START
                                   CHOICE {
EIMTA-MainConfig-r12 ::=
     release
                                              NULL,
     setup
                                              SEQUENCE {
          eimta-RNTI-r12
                                              C-RNTI,
          eimta-CommandPeriodicity-r12 ENUMERATED {sf10, sf20, sf40, sf80},
eimta-CommandSubframeSet-r12 BIT STRING (SIZE(10))
     }
}
                                            CHOICE {
EIMTA-MainConfigServCell-r12 ::=
     release
                                                  NULL,
     setup
                                                  SEQUENCE {
          eimta-UL-DL-ConfigIndex-r12
                                                        INTEGER (1..5),
          eimta-UL-DL-ConfigIndex-r12 INTEGER
eimta-HARQ-ReferenceConfig-r12 ENUMERAT
mbsfn-SubframeConfigList-v1250 CHOICE {
                                                        ENUMERATED {sa2, sa4, sa5},
                    release
                                                                  NULL,
                                                                  SEQUENCE {
                    setup
                    subframeConfigList-r12
                                                                  MBSFN-SubframeConfigList
               }
          }
     }
}
```

-- ASN1STOP

#### EIMTA-MainConfig field descriptions

eimta-CommandPeriodicity	
Configures the periodicity to monitor PDCCH with eIMTA-RNTI, see TS 36.213 [23], clause 13.1. Value sf10	
corresponds to 10 subframes, sf20 corresponds to 20 subframes and so on.	
eimta-CommandSubframeSet	
Configures the subframe(s) to monitor PDCCH with eIMTA-RNTI within the periodicity configured by <i>eimta</i> -	
CommandPeriodicity. The 10 bits correspond to all subframes in the last radio frame within each periodicity. T	
most bit is for subframe 0 and so on. Each bit can be of value 0 or 1. The value of 1 means that the correspon	
subframe is configured for monitoring PDCCH with eIMTA-RNTI, and the value of 0 means otherwise. In case	
as PCell, only the downlink and the special subframes indicated by the UL/ DL configuration in SIB1 can be co	
for monitoring PDCCH with eIMTA-RNTI. In case of FDD as PCell, any of the ten subframes can be configured	d for
monitoring PDCCH with eIMTA-RNTI.	
eimta-HARQ-ReferenceConfig	
Indicates UL/ DL configuration used as the DL HARQ reference configuration for this serving cell. Value sa2	
corresponds to Configuration2, sa4 to Configuration4 etc, as specified in TS 36.211 [21], table 4.2-2. E-UTRA	N
configures the same value for all serving cells residing on same frequency band.	
eimta-UL-DL-ConfigIndex	
Index of I, see TS 36.212 [22], clause 5.3.3.1.4. E-UTRAN configures the same value for all serving cells resid	ling on
same frequency band.	
mbsfn-SubframeConfigList	
Configure the MBSFN subframes for the UE on this serving cell. An uplink subframe indicated by the DL/UL su	Jbframe
configuration in SIB1 can be configured as MBSFN subframe.	

## LogicalChannelConfig

The IE LogicalChannelConfig is used to configure the logical channel parameters.

### LogicalChannelConfig information element

ASN1START	
LogicalChannelConfig ::=	SEQUENCE {
ul-SpecificParameters	SEQUENCE

}

480

	priority prioritisedBitRate	kBps256, infinity, kBps2048-v1020, spa	kBps512-v1020	, kBps1024-v1020,
	bucketSizeDuration	ENUMERATED {	ms300, ms500	, ms1000, spare2,
}	logicalChannelGroup OPTIONAL,	INTEGER (03)	OPTIONAL	Need OR Cond UL
 [[ ]],	, logicalChannelSR-Mask-r9	ENUMERATED $\{setup\}$	OPTIONAL	Cond SRmask
[[]],	logicalChannelSR-Prohibit-r12	BOOLEAN	OPTIONAL	Need ON
[	laa-UL-Allowed-r14 bitRateQueryProhibitTimer-r14 ENU	s0, s0dot4, s0dot8, s1d		
]], [[	release NULL, setup SEQUENCE {	` ,		
	} logicalChannelSR-Restriction-r15 CH release NULL,			Need ON
	}	<pre>isedBitRate ENUMERATED {     kBps0, kBps6, kBps16, kBps2, kBps64, kBps124, v1020,     kBps206, infinity, kBps12-v1020, kBps1024-v1020,     kBps2048-v1020, spare5, spare4, spare3, spare2,     spare1}, izeDuration ENUMERATED {     ms50, ms100, ms150, ms300, ms500, ms1000, spare2,     spare1}, ChannelGroup INTEGER (0.3) OPTIONAL Need OR IONAL, Need ON ChannelSR-Mask-r9 ENUMERATED {setup} OPTIONAL Need ON Allowed-r14 BOOLEAN OPTIONAL Need ON Allowed-r14 ENUMERATED {     s0, s0dot4, s0dot8, s1dot6, s3, s6, s12,     s30} OPTIONAL Need OR FTI-Lengths-r15 CHOICE {     sase NULL,     up SEQUENCE {     shortTTI-r15 BOOLEAN,     subframeTTI-r15 BOOLEAN,     subframeTTI-r15 BOOLEAN,     oPTIONAL, Need ON AlaccessPriority-r15 CHOICE {     aase NULL,     up INTEGER (14)     OPTIONAL, Need ON </pre>		
]] } ASN1:	Ich-CellRestriction-r15	BIT STRING (SIZE (maxSe	rvCell-r13))	OPTIONAL Need ON

	LogicalChannelConfig field descriptions
allowedTTI-Lengths	
	engths for the logical channel. If not configured, the UE is allowed to transmit the logical
channel using any TTI leng	
bitRateQueryProhibitTim	er
The timer is used for bit rat	e recommendation query in TS 36.321 [6], clause 5.18, in seconds. Value s0 means 0s,
s0dot4 means 0.4s and so	on.
bucketSizeDuration	
Bucket Size Duration for log	gical channel prioritization in TS 36.321 [6]. Value in milliseconds. Value ms50 correspond
to 50 ms, ms100 correspor	nds to 100 ms and so on.
channelAccessPriority	
class (i.e. highest signalled	ss priority class for the logical channel. UE shall select the lowest channel access priority value) of the logical channel with MAC SDU multiplexed into the MAC PDU. MAC CEs the highest channel access priority class (i.e. lowest signalled value), as defined in TS
laa-UL-Allowed	
indicates that the logical ch	of a logical channel is allowed to be transmitted via UL of LAA SCells. Value <i>TRUE</i> annel is allowed to be sent via UL of LAA SCells. Value <i>FALSE</i> indicates that the logical e sent via UL of LAA SCells.
Ich-CellRestriction	
	stricted for the logical channel, The bit is set to 1 if the cell is restricted and to 0 if the cell i
corresponds to the serving logical channel is not allow	The least significant bit corresponds to the serving cell with index 0, the next bit cell with index 1, and so on. If the cell is restricted for the logical channel, then data for the ed to be sent using that cell. If the field is not included, no cells are restricted. See also TS The restriction is only active when PDCP duplication using CA is activated.
logicalChannelGroup	
Mapping of logical channel	to logical channel group for BSR reporting in TS 36.321 [6].
logicalChannelSR-Mask	
Controlling SR triggering or	n a logical channel basis when an uplink grant is configured. See TS 36.321 [6].
logicalChannelSR-Prohib	it
	the <i>logicalChannelSR-ProhibitTimer</i> is enabled for the logical channel. E-UTRAN only ield (i.e. indicates value <i>TRUE</i> ) if <i>logicalChannelSR-ProhibitTimer</i> is configured. See TS
logicalChannelSR-Restrie	ction
SPUCCH and value pucch transmit the SR on any SR	onfiguration for the logical channel. Value spucch indicates that the SR cannot be sent on indicates that the SR cannot be sent on PUCCH. If not configured, the UE is allowed to resource.
prioritisedBitRate	
	al channel prioritization in TS 36.321 [6]. Value in kilobytes/second. Value kBps0
	d, kBps8 corresponds to 8 kB/second, kBps16 corresponds to 16 kB/second and so on.
	e value for SRB1 and SRB2
priority	
	S 36.321 [6]. Value is an integer.
shortTTI, subframeTTI	
length for the logical chann	e TTIs respectively: Value TRUE indicates that the UE is allowed to transmit using this TT el and the value FALSE indicates that the UE is not allowed to transmit using this TTI el. If not configured for a TTI length, then the UE is allowed to transmit this logical channel
Conditional presence	Explanation
SRmask	The field is optionally present if <i>ul-SpecificParameters</i> is present, need OR: otherwise it i

Conditional presence	Explanation
SRmask	The field is optionally present if <i>ul-SpecificParameters</i> is present, need OR; otherwise it is
	not present.
UL	The field is mandatory present for UL logical channels; otherwise it is not present.
UL	The field is mandatory present for OL logical channels, otherwise it is not present.

# LWA-Configuration

_

The IE LWA-Configuration is used to setup/modify/release LTE-WLAN Aggregation.

```
-- ASN1START

LWA-Configuration-r13 ::= CHOICE {

release NULL,

setup SEQUENCE {

lwa-Config-r13 LWA-Config-r13

}
```

```
LWA-Config-r13 ::= SEQUENCE {
    lwa-MobilityConfig-r13 WLAN-MobilityConfig-r13 OPTIONAL, -- Need ON
    lwa-WT-Counter-r13 INTEGER (0..65535) OPTIONAL, -- Need ON
    ...,
    [[ wt-MAC-Address-r14 OCTET STRING (SIZE (6)) OPTIONAL -- Need ON
    ]]
}
-- ASN1STOP
```

#### LWA-Configuration field descriptions

 Iwa-MobilityConfig

 Indicates the parameters used for WLAN mobility.

 Iwa-WT-Counter

 Indicates the parameter used by UE for WLAN authentication.

 wt-MAC-Address

 Indicates the WT MAC address of the WT handling the LWA operation for the UE. The UE uses this MAC address in uplink transmissions to enable routing of LWA uplink data from the AP to the WT. E-UTRAN configures the field only if ul-LWA-Config-r14 is configured for at least one LWA bearer.

### LWIP-Configuration

The IE LWIP-Configuration is used to add, modify or release DRBs that are using LWIP Tunnel.

```
-- ASN1START
LWIP-Configuration-r13 ::=
                     CHOICE {
                     NULL,
  release
                        SEQUENCE {
  setup
     lwip-Config-r13
                          LWIP-Config-r13
  1
}
LWIP-Config-r13 ::= SEQUENCE {
  . . .
}
-- ASN1STOP
```

#### LWIP-Configuration field descriptions

Iwip-MobilityConfig Indicates the WLAN mobility set for LWIP. tunnelConfigLWIP Indicates the parameters used for establishing the LWIP tunnel.

### MAC-MainConfig

The IE *MAC-MainConfig* is used to specify the MAC main configuration for signalling and data radio bearers. All MAC main configuration parameters can be configured independently per Cell Group (i.e. MCG or SCG), unless explicitly specified otherwise.

### MAC-MainConfig information element

ASN1START	
MAC-MainConfig ::=	SEQUENCE {
ul-SCH-Config	SEQUENCE {
maxHARQ-Tx	ENUMERATED {
	n1, n2, n3, n4, n5, n6, n7, n8,
	n10, n12, n16, n20, n24, n28,
	<pre>spare2, spare1} OPTIONAL, Need ON</pre>
periodicBSR-Timer	PeriodicBSR-Timer-r12 OPTIONAL, Need ON
retxBSR-Timer	RetxBSR-Timer-r12,
ttiBundling	BOOLEAN

OPTIONAL, -- Need ON DRX-Config drx-Config OPTIONAL, -- Need ON timeAlignmentTimerDedicated TimeAlignmentTimer, CHOICE { phr-Config release NULL, setup SEQUENCE { ENUMERATED {sf10, sf20, sf50, sf100, sf200, sf500, sf1000, infinity}, periodicPHR-Timer prohibitPHR-Timer ENUMERATED {sf0, sf10, sf20, sf50, sf100, sf200, sf500, sf1000}, ENUMERATED {dB1, dB3, dB6, infinity} dl-PathlossChange } } OPTIONAL, -- Need ON OPTIONAL -- Need ON [[ sr-ProhibitTimer-r9 INTEGER (0..7) 11, [[ mac-MainConfig-v1020 SEOUENCE { z-MainConfig-v1020 SEQUENCE { sCellDeactivationTimer-r10 ENUMERATED { rf2, rf4, rf8, rf16, rf32, rf64, rf128, spare} OPTIONAL, -- Need OP ENUMERATED {setup} OPTIONAL, -- Need OR ENUMERATED {setup} OPTIONAL -- Need OR extendedBSR-Sizes-r10 extendedPHR-r10 OPTIONAL -- Need ON } ]], ]], [[ stag-ToReleaseList-r11 STAG-ToReleaseList-r11 OPTIONAL, -- Need ON stag-ToAddModList-r11 STAG-ToAddModList-r11 OPTIONAL, -- Need ON drx-Config-v1130 DRX-Config-v1130 OPTIONAL -- Need ON ]], dualConnectivityPHR CHOICE { release NULL [[ e-HARQ-Pattern-r12 OPTIONAL, -- Need ON NULL, SEQUENCE { setup ENUMERATED {real, virtual} phr-ModeOtherCG-r12 } OPTIONAL, -- Need ON logicalChannelSR-Config-r12 CHOICE { NULL, release SEQUENCE { setup logicalChannelSR-ProhibitTimer-r12 ENUMERATED {sf20, sf40, sf64, sf128, sf512, sf1024, sf2560, spare1} } } OPTIONAL -- Need ON ]], [[ drx-Config-v1310 DRX-Config-v1310 OPTIONAL, BOOLEAN OPTIONAL, -- Need ON -- Need ON extendedPHR2-r13 eDRX-Config-CycleStartOffset-r13 CHOICE { release NULL, setup CHOICE { sf5120 INTEGER(0..1), sf10240 INTEGER(0..3) } } OPTIONAL -- Need ON ]], [[ drx-Config-r13 CHOICE { release NULL, setup DRX-Config-r13 OPTIONAL -- Need ON } ]], [[ skipUplinkTx-r14 CHOICE { release NULL, tup skipUplinkTxSPS-r14 skipUplinkTxDynamic-r14 SEQUENCE { setup ENUMERATED {true} OPTIONAL, -- Need OR ENUMERATED {true} OPTIONAL -- Need OR } OPTIONAL, -- Need ON dataInactivityTimerConfig-r14 CHOICE { release NULL, SEQUENCE { setup dataInactivityTimer-r14 DataInactivityTimer-r14 } } OPTIONAL -- Need ON 11, [[ rai-Activation-r14 ENUMERATED {true} OPTIONAL -- Need OR ]], [[ shortTTI-AndSPT-r15 CHOICE { release NULL, SEQUENCE { setup

```
drx-Config-r15
                                                   DRX-Config-r15 OPTIONAL, -- Need ON
                periodicBSR-Timer-r15
                                                   ENUMERATED {
                                                       sf1, sf5, sf10, sf16, sf20, sf32, sf40,
                                                       sf64, sf80, sf128, sf160, sf320, sf640,
                                                       sf1280, sf2560, infinity}
                                                                                OPTIONAL, -- Need ON
                                                  ENUMERATED {nplus4set1, nplus6set1,
nplus6set2, nplus8set2 } OPTIONAL, -- Need ON
                proc-Timeline-r15
                                                                                OPTIONAL -- Need ON
                ssr-ProhibitTimer-r15
                                                  INTEGER (0..7)
            }
        }
                                                                               OPTIONAL, -- Need ON
        mpdcch-UL-HARQ-ACK-FeedbackConfig-r15 BOOLEAN OPTIONAL, -- Need ON
        dormantStateTimers-r15 CHOICE {
            release
                                                 NULL,
            setup
                                                  SEQUENCE {
                sCellHibernationTimer-r15
                                                      ENUMERATED {
                    rf2, rf4, rf8, rf16, rf32, rf64, rf128, spare}
                                                                          OPTIONAL,
                                                                                         -- Need OR
                 dormantSCellDeactivationTimer-r15 ENUMERATED {
                    rf2, rf4, rf8, rf16, rf32, rf64,
                     rf128, rf320, rf640, rf1280, rf2560,
                     rf5120, rf10240, spare3, spare2, spare1}
                                                                          OPTIONAL
                                                                                         -- Need OR
            }
        }
                                                                            OPTIONAL
                                                                                         -- Need ON
   ]]
}
MAC-MainConfigSCell-r11 ::=
                                     SEQUENCE {
                                         STAG-Id-r11 OPTIONAL, -- Need OP
  stag-Id-r11
    . . .
}
DRX-Config ::=
                                      CHOICE {
   release
                                         NULL,
                                          SEQUENCE {
    setup
                                                  psf1, psf2, psf3, psf4, psf5, psf6,
psf8, psf10, psf20, psf30, psf40,
psf50, psf60, psf80, psf100,
psf200},
        onDurationTimer
                                              ENUMERATED {
        drx-InactivityTimer
                                              ENUMERATED {
                                                  psf1, psf2, psf3, psf4, psf5, psf6,
psf8, psf10, psf20, psf30, psf40,
                                                   psf50, psf60, psf80, psf100,
                                                   psf200, psf300, psf500, psf750,
                                                   psf1280, psf1920, psf2560, psf0-v1020,
                                                  spare9, spare8, spare7, spare6,
spare5, spare4, spare3, spare2,
                                                  spare1},
        drx-RetransmissionTimer
                                              ENUMERATED {
                                                  psfl, psf2, psf4, psf6, psf8, psf16,
                                                  psf24, psf33},
                                         CHOICE {
        longDRX-CycleStartOffset
            sf10
                                             INTEGER(0..9),
                                              INTEGER(0..19),
            sf20
                                              INTEGER(0..31),
            sf32
            sf40
                                              INTEGER(0..39),
            sf64
                                              INTEGER(0..63),
            sf80
                                              INTEGER(0..79),
            sf128
                                              INTEGER(0..127),
                                              INTEGER(0..159),
            sf160
                                              INTEGER(0..255),
            sf256
            sf320
                                              INTEGER(0..319),
            sf512
                                              INTEGER(0..511),
                                              INTEGER(0..639),
            sf640
            sf1024
                                              INTEGER(0..1023),
            sf1280
                                              INTEGER(0..1279),
            sf2048
                                              INTEGER(0..2047),
            sf2560
                                              INTEGER(0..2559)
        },
        shortDRX
                                              SEQUENCE {
                                                  ENUMERATED {
            shortDRX-Cycle
                                                      sf2, sf5, sf8, sf10, sf16, sf20,
                                                       sf32, sf40, sf64, sf80, sf128, sf160,
                                                       sf256, sf320, sf512, sf640},
            drxShortCycleTimer
                                                  INTEGER (1..16)
       }
                OPTIONAL
                                                                                 -- Need OR
    }
}
```

DRX-Config-v1130 ::= SEQUENCE { drx-RetransmissionTimer-v1130 ENUMERATED {psf0-v1130} OPTIONAL, --Need OR CHOICE { longDRX-CycleStartOffset-v1130 INTEGER(0..59), sf60-v1130 sf70-v1130 INTEGER(0..69) OPTIONAL, ļ --Need OR shortDRX-Cycle-v1130 ENUMERATED {sf4-v1130} OPTIONAL --Need OR DRX-Config-v1310 ::= SEQUENCE { longDRX-CycleStartOffset-v1310 SEQUENCE { INTEGER(0..59) sf60-v1310 OPTIONAL } --Need OR } DRX-Config-r13 ::= SEQUENCE { ENUMERATED {psf300, psf400, psf500, psf600, onDurationTimer-v1310 psf800, psf1000, psf1200, psf1600} OPTIONAL, --Need OR drx-RetransmissionTimer-v1310 ENUMERATED {psf40, psf64, psf80, psf96, psf112, psf128, psf160, psf320} OPTIONAL, --Need OR ENUMERATED {psf0, psf1, psf2, psf4, psf6, psf8, psf16, drx-ULRetransmissionTimer-r13 psf24, psf33, psf40, psf64, psf80, psf96, psf112, psf128, psf160, psf320} OPTIONAL --Need OR } DRX-Config-r15 ::= SEOUENCE { drx-RetransmissionTimerShortTTI-r15 ENUMERATED { tti10, tti20, tti40, tti64, tti80, tti96, tti112,tti128, tti160, tti320} OPTIONAL, --Need OR drx-UL-RetransmissionTimerShortTTI-r15 ENUMERATED { tti0, tti1, tti2, tti4, tti6, tti8, tti16, tti24, tti33, tti40, tti64, tti80, tti96, tti112, tti128, tti160, tti320} OPTIONAL --Need OR } PeriodicBSR-Timer-r12 ::= ENUMERATED { sf5, sf10, sf16, sf20, sf32, sf40, sf64, sf80, sf128, sf160, sf320, sf640, sf1280, sf2560, infinity, spare1} RetxBSR-Timer-r12 ::= ENUMERATED { sf320, sf640, sf1280, sf2560, sf5120, sf10240, spare2, spare1} STAG-ToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxSTAG-r11)) OF STAG-Id-r11 STAG-TOAddModList-r11 ::= SEQUENCE (SIZE (1..maxSTAG-r11)) OF STAG-TOAddMod-r11 STAG-TOADdMod-r11 ::= SEQUENCE { STAG-Id-r11, stag-Id-r11 timeAlignmentTimerSTAG-r11 TimeAlignmentTimer, } STAG-Id-r11::= INTEGER (1..maxSTAG-r11) -- ASN1STOP

#### MAC-MainConfig field descriptions

#### dl-PathlossChange

DL Pathloss Change and the change of the required power backoff due to power management (as allowed by P-MPRc, see TS 36.101 [42]) for PHR reporting in TS 36.321 [6]. Value in dB. Value dB1 corresponds to 1 dB, dB3 corresponds to 3 dB and so on. The same value applies for each serving cell (although the associated functionality is performed independently for each cell).

#### dormantSCellDeactivationTimer

SCell deactivation timer for UEs supporting dormant state as specified in TS 36.321 [6]. Value in number of radio frames. Value rf4 corresponds to 4 radio frames, value rf8 corresponds to 8 radio frames and so on. E-UTRAN only configures the field if the UE is configured with one or more SCells other than the PSCell and PUCCH SCell. The same value applies for each SCell of a Cell Group (i.e. MCG or SCG) (although the associated functionality is performed independently for each SCell). Field *dormantSCellDeactivationTimer* does not apply for the PUCCH SCell.

#### drx-Config

Used to configure DRX as specified in TS 36.321 [6]. E-UTRAN configures the values in *DRX-Config-v1130* only if the UE indicates support for IDC indication. E-UTRAN configures *drx-Config-v1130*, *drx-Config-v1310* and *drx-Config-r13* only if *drx-Config* (without suffix) is configured. E-UTRAN configures *drx-Config-r13* only if UE supports CE or if the UE is configured with uplink of an LAA SCell.

#### drx-InactivityTimer

Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 corresponds to 0 PDCCH sub-frame and behaviour as specified in 7.3.2 applies, value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on.

#### drx-RetransmissionTimer

Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 corresponds to 0 PDCCH sub-frame and behaviour as specified in 7.3.2 applies, value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on. In case *drx-RetransmissionTimer-v1130* or *drx-RetransmissionTimer-v1310* is signalled, the UE shall ignore *drx-RetransmissionTimer* (i.e. without suffix).

### drx-RetransmissionTimerShortTTI

Timer for DRX in TS 36.321 [6]. Value in number of short TTIs when short TTI is configured. Value *tti10* corresponds to 10 TTIs, value *tti20* corresponds to 20 TTIs and so on.

### drx-ULRetransmissionTimer

Timer for DRX in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 correponds to 0 PDCCH subframe and behaviour as specified in 7.3.2 applies, value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on.

#### drx-UL-RetransmissionTimerShortTTI

Timer for DRX in TS 36.321 [6]. Value in number of short TTIs when short TTI is configured. Value *tti0* corresponds to 0 TTIs and behaviour as specified in 7.3.2 applies, value *tti1* corresponds to 1 TTI and so on.

#### drxShortCycleTimer

Timer for DRX in TS 36.321 [6]. Value in multiples of shortDRX-Cycle. A value of 1 corresponds to shortDRX-Cycle, a value of 2 corresponds to 2 * shortDRX-Cycle and so on.

### dualConnectivityPHR

Indicates if power headroom shall be reported using Dual Connectivity Power Headroom Report MAC Control Element defined in TS 36.321 [6] (value *setup*). For both LTE DC and (NG)EN-DC, if PHR functionality is configured, E-UTRAN always configures the value *setup* for this field and configures *phr-Config* and *dualConnectivityPHR*. For LTE DC, E-UTRAN configures the field for both CGs while for (NG)EN-DC, E-UTRAN configures the field only for MCG.

#### e-HARQ-Pattern

TRUE indicates that enhanced HARQ pattern for TTI bundling is enabled for FDD. E-UTRAN enables this field only when *ttiBundling* is set to *TRUE*.

### eDRX-Config-CycleStartOffset

Indicates *longDRX-Cycle* and *drxStartOffset* in TS 36.321 [6]. The value of *longDRX-Cycle* is in number of subframes. The value of *drxStartOffset*, in number of subframes, is indicated by the value of *eDRX-Config-CycleStartOffset* multiplied by 2560 plus the offset value configured in *longDRX-CycleStartOffset*. E-UTRAN only configures value *setup* when the value in *longDRX-CycleStartOffset* is sf2560.

#### extendedBSR-Sizes

If value *setup* is configured, the BSR index indicates extended BSR size levels as defined in TS 36.321 [6], Table 6.1.3.1-2.

#### extendedPHR

Indicates if power headroom shall be reported using the Extended Power Headroom Report MAC control element defined in TS 36.321 [6] (value *setup*). E-UTRAN always configures the value *setup* if more than one and up to eight Serving Cell(s) with uplink is configured and none of the serving cells with uplink configured has a *servingCellIndex* higher than seven and if PUCCH on SCell is not configured and if dual connectivity is not configured. E-UTRAN configures *extendedPHR* only if *phr-Config* is configured. The UE shall release *extendedPHR* if *phr-Config* is released.

#### extendedPHR2

Indicates if power headroom shall be reported using the Extended Power Headeroom Report MAC Control Element defined in TS 36.321 [6] (value *setup*). E-UTRAN always configures the value *setup* if any of the serving cells with uplink configured has a *servingCellIndex* higher than seven in case dual connectivity is not configured or if PUCCH SCell (with any number of serving cells with uplink configured) is configured. E-UTRAN configures *extendedPHR2* only if *phr-Config* is configured. The UE shall release *extendedPHR2* if *phr-Config* is released.

logicalChannelSR-ProhibitTimer	-MainConfig field descriptions
corresponds to 20 subframes, sf40 correspon	R for logical channels enabled by <i>logicalChannelSR-Prohibit</i> . Value sf20 ds to 40 subframes, and so on. See TS 36.321 [6].
ongDRX-Cycle is in number of sub-frames. V frames and so on. If <i>shortDRX-Cycle</i> is config Cycle value. The value of <i>drxStartOffset</i> value signalled, the UE shall ignore <i>longDRX-Cycle</i> s signalled, the UE shall ignore <i>longDRX-Cycle</i>	21 [6] unless <i>eDRX-Config-CycleStartOffset</i> is configured. The value of value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub- gured, the value of <i>longDRX-Cycle</i> shall be a multiple of the <i>shortDRX</i> - e is in number of sub-frames. In case <i>longDRX-CycleStartOffset-v1130</i> is <i>StartOffset</i> (i.e. without suffix). In case <i>longDRX-CycleStartOffset-v1310</i> <i>cleStartOffset</i> (i.e. without suffix).
<i>maxHARQ-Tx</i> Maximum number of transmissions for UL HA	RO in TS 36 321 [6]
mpdcch-UL-HARQ-ACK-FeedbackConfig TRUE indicates E-UTRAN may send UL HAR early termination of PUSCH transmission, or p	Q-ACK feedback or UL grant corresponding to a new transmission for positive acknowledgement of completed PUSCH transmissions as . In case of acknowledgement of RRC Connection Release, MPDCCH
onDurationTimer	
rame, psf2 corresponds to 2 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frament gnore on Duration Timer (i.e. without suffix).	ber of PDCCH sub-frames. Value psf1 corresponds to 1 PDCCH sub- mes and so on. In case onDurationTimer-v1310 is signalled, the UE sha
<b>periodicBSR-Timer</b> Timer for BSR reporting in TS 36.321 [6]. Valu sf20 corresponds to 20 sub-frames and so on	ue in number of sub-frames. Value sf10 corresponds to 10 sub-frames,
periodicPHR-Timer	ue in number of sub-frames. Value sf10 corresponds to 10 subframes,
phr-ModeOtherCG	or the PHR of the activated cells that are part of the other Cell Group (i.e
<b>proc-Timeline</b> Winimum processing timeline for short TTI wit set 1, value nplus6set1 indicates processing t	th subslot operation. Value nplus4set1 indicates processing time n+4 for time n+6 for set 1, value nplus6set2 indicates processing time n+6 for se ne n+8 for set 2. See also UE capability <i>min-Proc-TimelineSubslot</i> for
behaviour as specified in 7.3.2 applies, sf100	ue in number of sub-frames. Value sf0 corresponds to 0 subframes and corresponds to 100 subframes and so on.
<b>rai-Activation</b> Activation of release assistance indication (RA	AI) in TS 36.321 [6] for BL UEs.
retxBSR-Timer	ue in number of sub-frames. Value sf640 corresponds to 640 sub-
sCellDeactivationTimer SCell deactivation timer in TS 36.321 [6]. Value value rf8 corresponds to 8 radio frames and s or more SCells other than the PSCell and PU for this field and assume the value to be set to MCG or SCG) (although the associated functi sCellDeactivationTimer does not apply for the	ue in number of radio frames. Value rf4 corresponds to 4 radio frames, to on. E-UTRAN only configures the field if the UE is configured with one CCH SCell. If the field is absent, the UE shall delete any existing value to <i>infinity</i> . The same value applies for each SCell of a Cell Group (i.e. ionality is performed independently for each SCell). Field
rames. Value rf4 corresponds to 4 radio fram configures the field if the UE is configured with same value applies for each SCell of a Cell G performed independently for each SCell). Fiel	rmant SCell state as specified in TS 36.321 [6]. Value in number of radio res, value rf8 corresponds to 8 radio frames and so on. E-UTRAN only h one or more SCells other than the PSCell and PUCCH SCell. The roup (i.e. MCG or SCG) (although the associated functionality is Id sCellHibernationTimer does not apply for the PUCCH SCell.
corresponds to 5 subframes and so on. In cas <i>Cycle</i> (i.e. without suffix). Short DRX cycle is	umber of sub-frames. Value sf2 corresponds to 2 sub-frames, sf5 se <i>shortDRX-Cycle-v1130</i> is signalled, the UE shall ignore <i>shortDRX-</i> not configured for UEs in CE.
s <i>kipUplinkTxDynamic</i> f configured, the UE skips UL transmissions f available for transmission in the UE buffer as	for an uplink grant other than a configured uplink grant if no data is described in TS 36 321 [6]

#### MAC-MainConfig field descriptions

#### skipUplinkTxSPS

If configured, the UE skips UL transmissions for a configured uplink grant if no data is available for transmission in the UE buffer as described in TS 36.321 [6]. E-UTRAN always configures skipUplinkTxSPS when there is at least one SPS configuration with semiPersistSchedIntervalUL shorter than sf10 or when at least one SPS-ConfigUL-STTI is configured for the cell group.

#### sr-ProhibitTimer

Timer for SR transmission on PUCCH in TS 36.321 [6]. Value in number of SR period(s) of shortest SR period of any serving cell with PUCCH. Value 0 means that behaviour as specified in 7.3.2 applies. Value 1 corresponds to one SR period, Value 2 corresponds to 2*SR periods and so on. SR period is defined in TS 36.213 [23], table 10.1.5-1.

#### ssr-ProhibitTimer

Timer for prohibiting SR transmission on SPUCCH in TS 36.321 [6]. Value in number of SR period(s) of shortest SR period of any serving cell with SPUCCH. Value 0 means that behaviour as specified in 7.3.2 applies. Value 1 corresponds to one SR period, value 2 corresponds to 2 SR periods and so on. SR period is defined in TS 36.213 [23], table 10.1.5-1.

#### stag-ld

Indicates the TAG of an SCell, see TS 36.321 [6]. Uniquely identifies the TAG within the scope of a Cell Group (i.e. MCG or SCG). If the field is not configured for an SCell (e.g. absent in MAC-MainConfigSCell), the SCell is part of the PTAG

#### stag-ToAddModList, stag-ToReleaseList

Used to configure one or more STAGs. E-UTRAN ensures that a STAG contains at least one SCell with configured uplink. If, due to SCell release a reconfiguration would result in an 'empty' TAG, E-UTRAN includes release of the concerned TAG.

#### timeAlignmentTimerSTAG

Indicates the value of the time alignment timer for an STAG, see TS 36.321 [6].

#### ttiBundling

TRUE indicates that TTI bundling TS 36.321 [6] is enabled while FALSE indicates that TTI bundling is disabled. TTI bundling can be enabled for FDD and for TDD for configurations 0, 1 and 6 and additionally for configurations 2 and 3 when symPUSCH-UpPTS-r14 is configured. The functionality is performed independently per Cell Group (i.e. MCG or SCG), but E-UTRAN does not configure TTI bundling for the SCG. For a TDD PCell, E-UTRAN does not simultaneously enable TTI bundling and semi-persistent scheduling in this release of specification. Furthermore, for a Cell Group, E-UTRAN does not simultaneously configure TTI bundling and SCells with configured uplink, and E-UTRAN does not simultaneously configure TTI bundling and eIMTA.

# P-C-AndCBSR

The IE *P*-*C*-*AndCBSR* is used to specify the power control and codebook subset restriction configuration.

### P-C-AndCBSR information elements

```
-- ASN1START
P-C-AndCBSR-r11 ::= SEQUENCE {
   p-C-r11
                                INTEGER (-8..15),
    codebookSubsetRestriction-r11 BIT STRING
}
P-C-AndCBSR-r13 ::= SEQUENCE {
    p-C-r13
                                INTEGER (-8..15),
    cbsr-Selection-r13
                               CHOICE {
                                    SEQUENCE {
       nonPrecoded-r13
           codebookSubsetRestriction1-r13
                                                        BIT STRING.
            codebookSubsetRestriction2-r13
                                                        BIT STRING
        },
        beamformedKla-r13
                                    SEQUENCE {
           codebookSubsetRestriction3-r13
                                                        BIT STRING
        },
        beamformedKN-r13
                                    SEOUENCE {
            codebookSubsetRestriction-r13
                                                        BIT STRING
        }
    },
    . . .
}
P-C-AndCBSR-r15 ::= SEQUENCE {
    p-C-r15
                                INTEGER (-8..15),
    codebookSubsetRestriction4-r15 BIT STRING
}
```

P-C-AndCBSR-Pair-r13a ::=	SEQUENCE	(SIZE	(12))	OF	P-C-AndCBSR-r11
P-C-AndCBSR-Pair-r13 ::=	SEQUENCE	(SIZE	(12))	OF	P-C-AndCBSR-r13
P-C-AndCBSR-Pair-r15 ::=	SEQUENCE	(SIZE	(12))	OF	P-C-AndCBSR-r15
ASN1STOP					

#### cbsr-Selection

Indicates which codebook subset restriction parameter(s) are to be used. E-UTRAN applies values nonPrecoded when eMIMO-Type is set to nonPrecoded. E-UTRAN applies value beamformedK1a when eMIMO-Type is set to beamformed, alternativeCodebookEnabledBeamformed is set to TRUE and csi-RS-ConfigNZPIdListExt is not configured. E-UTRAN applies value beamformedKN when csi-RS-ConfigNZPIdListExt is configured. E-UTRAN applies value beamformedKN when eMIMO-Type is set to beamformed, csi-RS-ConfigNZPIdListExt is not configured and alternativeCodebookEnabledBeamformed is set to FALSE. codebookSubsetRestriction Parameter: codebookSubsetRestriction, see TS 36.213 [23] and TS 36.211 [21]. The number of bits in the

P-C-AndCBSR field descriptions

codebookSubsetRestriction for applicable transmission modes is defined in TS 36.213 [23].

### codebookSubsetRestriction1

Parameter: codebookSubsetRestriction1, see TS 36.213 [23], Table 7.2-1d. The number of bits in the codebookSubsetRestriction1 for applicable transmission modes is defined in TS 36.213 [23].

#### codebookSubsetRestriction2

Parameter: codebookSubsetRestriction2, see TS 36.213 [23], Table 7.2-1e. The number of bits in the codebookSubsetRestriction2 for applicable transmission modes is defined in TS 36.213 [23].

#### codebookSubsetRestriction3

Parameter: codebookSubsetRestriction3, see TS 36.213 [23], Table 7.2-1f. The UE shall ignore codebookSubsetRestriction-r11 or codebookSubsetRestriction-r10 if codebookSubsetRestriction3-r13 is configured. The number of bits in the codebookSubsetRestriction3 for applicable transmission modes is defined in TS 36.213 [23]. codebookSubsetRestriction4 Parameter: codebookSubsetRestriction4, see TS 36.213 [23], Table 7.2. The number of bits in the codebookSubsetRestriction4 for applicable transmission modes is defined in TS 36.213 [23].

#### p-C

Parameter: P_c, see TS 36.213 [23], clause 7.2.5.

### P-C-AndCBSR-Pair

E-UTRAN includes a single entry if the UE is configured with TM9. If the UE is configured with TM10 and E-UTRAN includes 2 entries, this indicates that the subframe patterns configured for CSI (CQI/PMI/PTI/RI/CRI) reporting (i.e. as defined by field csi-MeasSubframeSet1 and csi-MeasSubframeSet2, or as defined by csi-MeasSubframeSets-r12) are to be used for this CSI process, while including a single entry indicates that the subframe patterns are not to be used for this CSI process. For a UE configured with TM10, E-UTRAN does not include 2 entries with csi-MeasSubframeSet1 and csi-MeasSubframeSet2 for CSI processes concerning a secondary frequency. Furthermore, E-UTRAN includes 2 entries when configuring both cqi-pmi-ConfigIndex and cqi-pmi-ConfigIndex2.

### PDCCH-ConfigSCell

The IE PDCCH-ConfigSCell specifies PDCCH monitoring parameters that E-UTRAN may configure for a serving cell.

#### PDCCH-ConfigSCell information element

ASN1START		
PDCCH-ConfigSCell-r13 ::= SEQUENCE { skipMonitoringDCI-format0-1A-r13 ENUMERATED {true} }	OPTIONAL	Need OR
PDCCH-ConfigLAA-r14 ::= SEQUENCE {		
maxNumberOfSchedSubframes-FormatOB-r14 ENUMERATED {sf2, sf3, sf4}	OPTIONAL,	Need OR
maxNumberOfSchedSubframes-Format4B-r14 ENUMERATED {sf2, sf3, sf4}	OPTIONAL,	Need OR
skipMonitoringDCI-Format0A-r14 ENUMERATED {true}	OPTIONAL,	Need OR
skipMonitoringDCI-Format4A-r14 ENUMERATED {true}	OPTIONAL,	Need OR
pdcch-CandidateReductions-Format0A-r14		
PDCCH-CandidateReductions-r13	OPTIONAL,	Need ON
pdcch-CandidateReductions-Format4A-r14		
PDCCH-CandidateReductionsLAA-UL-r14	OPTIONAL,	Need ON
pdcch-CandidateReductions-Format0B-r14		
PDCCH-CandidateReductionsLAA-UL-r14	OPTIONAL,	Need ON
pdcch-CandidateReductions-Format4B-r14		

PDCCH-Cand	lidateReductionsLAA-UL-r14 OPTIONAL	Need ON
, PDCCH-CandidateReductionValue-r13 ::= ENUM	MERATED {n0, n33, n66, n100}	
PDCCH-CandidateReductionValue-r14 ::= ENUM	MERATED {n0, n50, n100, n150}	
PDCCH-CandidateReductions-r13 ::= CHOICE { release NULL, setup SEQUEN pdcch-candidateReductionAL1-r13 pdcch-candidateReductionAL2-r13		
<pre>pdcch-candidateReductionAL3-r13 pdcch-candidateReductionAL4-r13 pdcch-candidateReductionAL5-r13 }</pre>	PDCCH-CandidateReductionValue-r13, PDCCH-CandidateReductionValue-r13, PDCCH-CandidateReductionValue-r13	
<pre>} PDCCH-CandidateReductionsLAA-UL-r14 ::= CH release NULL,</pre>	IOICE {	
setup SEQUEN	ICE {	
pdcch-candidateReductionAL1-r14 pdcch-candidateReductionAL2-r14 pdcch-candidateReductionAL3-r14 pdcch-candidateReductionAL3-r14 pdcch-candidateReductionAL5-r14 }	PDCCH-CandidateReductionValue-r13, PDCCH-CandidateReductionValue-r13, PDCCH-CandidateReductionValue-r14, PDCCH-CandidateReductionValue-r14, PDCCH-CandidateReductionValue-r14	

-- ASN1STOP

PDCCH-ConfigSCell field descriptions	
xNumberOfSchedSubframes-Format0B	
licates maximum number of schedulable subframes for DCI format 0B as specified in TS 36.213 [23]. Value sf2 responds to 2 subframes, value sf3 corresponds to 3 subframes and so on.	
In Sponds to 2 submaries, value sis corresponds to 5 submaries and so on.	
icates maximum number of schedulable subframes for DCI format 4B as specified in TS 36.213 [23]. Value sf2 responds to 2 subframes, value sf3 corresponds to 3 subframes and so on.	
ipMonitoringDCI-format0-1A	
icates whether the UE is configured to omit monitoring DCI fromat 0/1A, see TS 36.213 [23], clause 9.1.1.	
ipMonitoringDCI-Format0A	
icates whether the UE is configured to omit monitoring DCI fromat 0A as specified in TS 36.213 [23].	
ipMonitoringDCI-Format4A	
icates whether the UE is configured to omit monitoring DCI fromat 4A as specified in TS 36.213 [23].	
cch-candidateReductionALx	
licates reduced (E)PDCCH monitoring requirements on UE specific search space of the x-th aggregation level, s	е
36.213 [23], clause 9.1.1. Value n0 corresponds to 0%, value n33 corresponds to 33% and so on.	
cch-CandidateReductions-Formatx	
licates number of blind detections on UE specific search space for each aggregation layer as specified in TS 36.	213
]. The field can only be present when the UE is configured with uplink of an LAA SCell. If pdcch-	
ndidateReductions-Formatx is not configured, pdcch-CandidateReductions-r13 applies to the corresponding DC configured).	S

PDCP-Config

The IE *PDCP-Config* is used to set the configurable PDCP parameters for data radio bearers.

## PDCP-Config information element

ASN1START				
PDCP-Config ::=	SEQUENCE {			
discardTimer	ENUMERATED {			
	ms50, ms100, ms150, ms300, ms500,			
	ms750, ms1500, infinity			
}		OPTIONAL,	Cond Setup	
rlc-AM	SEQUENCE {			
statusReportRequired	BOOLEAN			
}		OPTIONAL,	Cond Rlc-AM	
rlc-UM	SEQUENCE {			

ENUMERATED {len7bits, len12bits} pdcp-SN-Size OPTIONAL, -- Cond Rlc-UM headerCompression CHOICE { notUsed NULL, SEQUENCE { rohc INTEGER (1..16383) maxCID DEFAULT 15, SEQUENCE { profiles profile0x0001 BOOLEAN, profile0x0002 BOOLEAN, profile0x0003 BOOLEAN, profile0x0004 BOOLEAN, profile0x0006 BOOLEAN, profile0x0101 BOOLEAN. profile0x0102 BOOLEAN, profile0x0103 BOOLEAN, profile0x0104 BOOLEAN }, . . . } }, [[ rn-IntegrityProtection-r10 ENUMERATED {enabled} OPTIONAL -- Cond RN ]], [[ pdcp-SN-Size-v1130 ENUMERATED {len15bits} OPTIONAL -- Cond Rlc-AM2 11, [[ ul-DataSplitDRB-ViaSCG-r12 OPTIONAL, -- Need ON BOOLEAN t-Reordering-r12 ENUMERATED { ms0, ms20, ms40, ms60, ms80, ms100, ms120, ms140, ms160, ms180, ms200, ms220, ms240, ms260, ms280, ms300, ms500, ms750, spare14, spare13, spare12, spare11, spare10, spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1} OPTIONAL -- Cond SetupS ]], CHOICE { 11 ul-DataSplitThreshold-r13 release NULL, setup ENUMERATED { b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800, b25600, b51200, b102400, b204800, b409600, b819200, spare1} OPTIONAL, -- Need ON pdcp-SN-Size-v1310 ENUMERATED {len18bits} OPTIONAL, -- Cond Rlc-AM3 CHOICE { statusFeedback-r13 NULL, release SEQUENCE { setup statusPDU-TypeForPolling-r13 ENUMERATED {type1, type2} OPTIONAL, --Need ON statusPDU-Periodicity-Type1-r13 ENUMERATED { ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70, ms80, ms90, ms100, ms150, ms200, ms300, ms500, ms1000, ms2000, ms5000, ms10000, ms20000, ms50000} OPTIONAL, -- Need ON ENUMERATED { statusPDU-Periodicity-Type2-r13 ms5, ms10, ms20, ms30, ms40, ms50, ms60, ms70, ms80, ms90, ms100, ms150, ms200, ms300, ms500, ms1000, ms2000, ms5000, ms10000, ms20000, ms50000} OPTIONAL, -- Need ON statusPDU-Periodicity-Offset-r13 ENUMERATED { ms1, ms2, ms5, ms10, ms25, ms50, ms100, ms250, ms500, ms2500, ms5000, ms25000} OPTIONAL -- Need ON } } OPTTONAL -- Need ON 11, ul-LWA-Config-r14 ]]] CHOICE { NULL, release SEQUENCE { setup ul-LWA-DRB-ViaWLAN-r14 BOOLEAN, ul-LWA-DataSplitThreshold-r14 ENUMERATED { b0, b100, b200, b400, b800, b1600, b3200, b6400, b12800, b25600, b51200, b102400, b204800, b409600, b819200 } OPTIONAL -- Need OR } OPTIONAL, -- Need ON uplinkOnlyHeaderCompression-r14 CHOICE { notUsed-r14 NULL, SEQUENCE { rohc-r14 maxCTD-r14 INTEGER (1..16383) DEFAULT 15, profiles-r14 SEQUENCE { profile0x0006-r14 BOOLEAN }, . . .

```
}
        }
                                                                        OPTIONAL -- Need ON
    ]],
    11,
[[ uplinkDataCompression-r15 SEQUENCE {
    bufferSize-r15 ENUMERATED {kbyte2, kbyte4, kbyte8, spare1},
    dictionary-r15 ENUMERATED {sip-SDP, operator} OPTIONAL, -- Need OR
...
              . . .
         }
                                                                               OPTIONAL, -- Cond Rlc-AM4
         pdcp-DuplicationConfig-r15 CHOICE {
                         NULL,
SEQUENCE {
             release
             setup
                 pdcp-Duplication-r15 ENUMERATED {configured, activated}
              }
         }
                                                                       OPTIONAL -- Need ON
    ]]
}
-- ASN1STOP
```

#### **PDCP-Config field descriptions**

#### bufferSize Indicates the buffer size applied for UDC specified in TS 36.323 [8]. Value kbyte2 means 2048 bytes, kbyte4 means 4096 bytes and so on. E-UTRAN does not reconfigure bufferSize for a DRB except for handover cases. dictionarv Indicates which pre-defined dictionary is used for UDC as specified in TS 36.323 [8]. The value sip-SDP means that UE shall prefill the buffer with standard dictionary for SIP and SDP defined in TS 36.323 [8], and the value operator means that UE shall prefill the buffer with operator-defined dictionary. discardTimer Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value ms50 means 50 ms, ms100 means 100 ms and so on. headerCompression E-UTRAN does not reconfigure header compression for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment. E-UTRAN does not reconfigure header compression for a SCG DRB except for upon SCG change involving PDCP re-establishment. For split and LWA DRBs E-UTRAN configures only notUsed. E-UTRAN only configures this field when neither uplinkOnlyHeaderCompression nor uplinkDataCompression is configured. If headerCompression is configured, the UE shall apply the configured ROHC profile(s) in both uplink and downlink. maxCID Indicates the value of the MAX_CID parameter as specified in TS 36.323 [8]. The total value of MAX_CIDs across all bearers for the UE should be less than or equal to the value of maxNumberROHC-ContextSessions parameter as indicated by the UE. pdcp-Duplication

Parameter for configuring PDCP duplication as specified in TS 36.323 [8]. Value *configured* indicates that PDCP duplication is configured but initially deactivated and value *activated* indicates that PDCP duplication is configured and activated upon configuration. For EN-DC, E-UTRAN configures PDCP duplication for MCG DRB only if PDCP duplication is not configured for any split DRB.

#### pdcp-SN-Size

Indicates the PDCP Sequence Number length in bits. For RLC UM: value *len7bits* means that the 7-bit PDCP SN format is used and *len12bits* means that the 12-bit PDCP SN format is used. For RLC AM: value *len15bits* means that the 15-bit PDCP SN format is used, value *len18bits* means that the 18-bit PDCP SN format is used, otherwise if the field is not included upon setup of the PCDP entity 12-bit PDCP SN format is used, as specified in TS 36.323 [8].

### profiles

The profiles used by both compressor and decompressor in both UE and E-UTRAN. The field indicates which of the ROHC profiles specified in TS 36.323 [8] are supported, i.e. value *true* indicates that the profile is supported. Profile 0x0000 shall always be supported when the use of ROHC is configured. If support of two ROHC profile identifiers with the same 8 LSB's is signalled, only the profile corresponding to the highest value shall be applied. E-UTRAN does not configure ROHC while *t-Reordering* is configured (i.e. for split DRBs, for LWA bearers or upon reconfiguration from split or LWA to MCG DRB).

#### statusFeedback

Indicates whether the UE shall send PDCP Status Report periodically or by E-UTRAN polling as specified in TS 36.323 [8]. E-UTRAN configures this field only for LWA DRB.

### statusPDU-TypeForPolling

Indicates the PDCP Control PDU option when it is triggered by E-UTRAN polling. Value *type1* indicates using the legacy PDCP Control PDU for PDCP status reporting and value *type2* indicates using the LWA specific PDCP Control PDU for LWA status reporting as specified in TS 36.323 [8].

#### statusPDU-Periodicity-Type1

Indicates the value of the PDCP Status reporting periodicity for *type1* Status PDU, as specified in TS 36.323 [8]. Value in milliseconds. Value ms5 means 5 ms, ms10 means 10 ms and so on.

#### statusPDU-Periodicity-Type2

Indicates the value of the PDCP Status reporting periodicity for *type2* Status PDU, as specified in TS 36.323 [8]. Value in milliseconds. Value ms5 means 5 ms, ms10 means 10 ms and so on.

#### statusPDU-Periodicity-Offset

Indicates the value of the offset for *type2* Status PDU periodicity, as specified in TS 36.323 [8]. Value in milliseconds. Value ms1 means 1 ms, ms2 means 2 ms and so on.

### t-Reordering

Indicates the value of the reordering timer, as specified in TS 36.323 [8]. Value in milliseconds. Value ms0 means 0 ms and behaviour as specified in 7.3.2 applies, ms20 means 20 ms and so on.

#### rn-IntegrityProtection

Indicates that integrity protection or verification shall be applied for all subsequent packets received and sent by the RN on the DRB.

### statusReportRequired

Indicates whether or not the UE shall send a PDCP Status Report upon re-establishment of the PDCP entity and upon PDCP data recovery as specified in TS 36.323 [8].

#### **PDCP-Config field descriptions**

#### ul-DataSplitDRB-ViaSCG

Indicates whether the UE shall send PDCP PDUs via SCG as specified in TS 36.323 [8]. E-UTRAN only configures the field (i.e. indicates value *TRUE*) for split DRBs. For PDCP duplication, if this field is set to *TRUE*, the primary RLC entity is SCG RLC entity and the secondary RLC entity is MCG RLC entity. If this field is not configured or set to *FALSE*, the primary RLC entity is MCG RLC entity and the secondary RLC entity is SCG RLC entity.

#### ul-DataSplitThreshold

Indicates the threshold value for uplink data split operation specified in TS 36.323 [8]. Value b100 means 100 Bytes, b200 means 200 Bytes and so on. E-UTRAN only configures this field for split DRBs.

### ul-LWA-DRB-ViaWLAN

Indicates whether the UE shall send PDCP PDUs via the LWAAP entity as specified in TS 36.323 [8]. E-UTRAN only configures this field (i.e. indicates value *TRUE*) for LWA DRBs.

#### ul-LWA-DataSplitThreshold

Indicates the threshold value for uplink data split operation as specified in TS 36.323 [8]. Value b0 means 0 Bytes, b100 means 100 Bytes and so on. E-UTRAN only configures this field for LWA DRBs.

#### uplinkDataCompression

Indicates the UDC configuration that the UE shall apply. E-UTRAN does not configure *uplinkDataCompression* for a DRB, if *headerCompression* or *uplinkOnlyHeaderCompression* is already configured for the DRB. E-UTRAN does not configure *uplinkDataCompression* for the split and LWA DRBs. The maximum number of DRBs where *uplinkDataCompression* can be applied is two. In this version of the specification, for existing DRBs, E-UTRAN can

uplinkDataCompression can be applied is two. In this version of the specification, for existing DRBs, E-UTRAN can only configure uplinkDataCompression via handover procedure.

### uplinkOnlyHeaderCompression

Indicates the ROHC configuration that the UE shall apply uplink-only ROHC operations, see TS 36.323 [8]. E-UTRAN only configures this field when *headerCompression* is not configured.

E-UTRAN does not reconfigure header compression for an MCG DRB except for upon handover and upon the first reconfiguration after RRC connection re-establishment. E-UTRAN does not reconfigure header compression for a SCG DRB except for upon SCG change involving PDCP re-establishment. For split and LWA DRBs E-UTRAN configures only *notUsed*.

Conditional presence	Explanation			
Ric-AM	The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need ON, in case of reconfiguration of a PDCP entity at handover, at the first reconfiguration after RRC re-establishment or at SCG change involving PDCP re-establishment or PDCP data recovery for a radio bearer configured with RLC AM. Otherwise the field is not present.			
RIc-AM2	The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM. Otherwise the field is not present.			
Rlc-AM3	The field is optionally present, need OP, upon setup of a PDCP entity for a radio bearer configured with RLC AM, if <i>pdcp-SN-Size-v1130</i> is absent. Otherwise the field is not present.			
RIc-AM4	The field is optionally present, need ON, upon setup of a PDCP entity for a radio bearer configured with RLC AM. The field is optional, need OP, in case of reconfiguration of a PDCP entity at handover. Otherwise the field is not present and the UE shall continue to use the existing value.			
RIc-UM	The field is mandatory present upon setup of a PDCP entity for a radio bearer configured with RLC UM. It is optionally present, Need ON, upon handover within E-UTRA, upon the first reconfiguration after re-establishment and upon SCG change involving PDCP re-establishment. Otherwise the field is not present.			
RN	The field is optionally present when signalled to the RN, need OR. Otherwise the field is not present.			
Setup	The field is mandatory present in case of radio bearer setup. Otherwise the field is optionally present, need ON.			
SetupS	The field is mandatory present in case of setup of or reconfiguration to a split DRB or LWA DRB. The field is optionally present upon reconfiguration of a split DRB or LWA DRB or upon DRB type change from split to MCG DRB or from LWA to LTE only, need ON. Otherwise the field is not present.			

### PDSCH-Config

The IE *PDSCH-ConfigCommon* and the IE *PDSCH-ConfigDedicated* are used to specify the common and the UE specific PDSCH configuration respectively.

**PDSCH-Config** information element

-- ASN1START PDSCH-ConfigCommon ::= SEQUENCE { referenceSignalPower INTEGER (-60..50), p-b INTEGER (0..3) } PDSCH-ConfigCommon-v1310 ::= SEQUENCE { pdsch-maxNumRepetitionCEmodeA-r13 ENUMERATED { r16, r32 } OPTIONAL, -- Need OR pdsch-maxNumRepetitionCEmodeB-r13 ENUMERATED r192, r256, r384, r512, r768, r1024, r1536, r2048} OPTIONAL -- Need OR } PDSCH-ConfigDedicated::= SEOUENCE { ENUMERATED { p-a dB-6, dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3} PDSCH-ConfigDedicated-v1130 ::= SEOUENCE { DMRS-Config-r11 OPTIONAL, -- Need ON ENUMERATED {typeA, typeB} OPTIONAL, -- Need OR dmrs-ConfigPDSCH-r11 DMRS-Config-r11 gcl-Operation re-MappingQCLConfigToReleaseList-r11 RE-MappingQCLConfigToReleaseList-r11 OPTIONAL, Need ON re-MappingQCLConfigToAddModList-rll RE-MappingQCLConfigToAddModList-rll OPTIONAL Need ON } PDSCH-ConfigDedicated-v1280 ::= SEQUENCE { tbsIndexAlt-r12 ENUMERATED {a26, a33} OPTIONAL -- Need OR } PDSCH-ConfigDedicated-v1310 ::= SEOUENCE { dmrs-ConfigPDSCH-v1310 DMRS-Config-v1310 OPTIONAL -- Need ON } PDSCH-ConfigDedicated-v1430 ::= SEQUENCE { SEQUENCE { ENUMERATED {bw5, bw20} ENUMERATED {on} ce-PDSCH-MaxBandwidth-r14 ce-PDSCH-TenProcesses-r14 ce-HARQ-AckBundling-r14 OPTIONAL, -- Need OP -- Need OR OPTIONAL, ENUMERATED {on} OPTIONAL, -- Need OR ENUMERATED {range1, range2} ce-SchedulingEnhancement-r14 OPTIONAL, -- Need OR -- Need OR tbsIndexAlt2-r14 ENUMERATED {b33} OPTIONAL } PDSCH-ConfigDedicated-v1530 ::= SEQUENCE { qcl-Operation-v1530ENUMERATED {typeC}OPTIONAL,tbs-IndexAlt3-r15ENUMERATED {a37}OPTIONAL, -- Need OR -- Need OR -- eNote (ToDo): Clarify that eMTC fields (i.e. fields starting with ce-) do not apply -- for SCell (merging issue) ce-CQI-AlternativeTableConfig-r15 ENUMERATED {on} OPTIONAL, -- Need OR OPTIONAL, OPTIONAL, ENUMERATED {on} ce-PDSCH-64QAM-Config-r15 -- Need OR ce-PDSCH-FlexibleStartPRB-AllocConfig-r15 ENUMERATED {on} -- Need OR ENUMERATED {oDot5, oDot625, oDot75, oDot875} OPTIONAL -altMCS-TableScalingConfig-r15 Need OR PDSCH-ConfigDedicatedSCell-v1430 ::= SEQUENCE { ENUMERATED {b33} tbsIndexAlt2-r14 OPTIONAL -- Need OR } RE-MappingQCLConfigToAddModList-r11 ::= SEQUENCE (SIZE (1..maxRE-MapQCL-r11)) OF PDSCH-RE-MappingQCL-Config-r11 RE-MappingQCLConfigToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxRE-MapQCL-r11)) OF PDSCH-RE-MappingQCL-ConfigId-r11 PDSCH-RE-MappingQCL-Config-r11 ::= SEQUENCE { pdsch-RE-MappingQCL-ConfigId-r11 PDSCH-RE-MappingQCL-ConfigId-r11, optionalSetOfFields-r11 SEQUENCE { ENUMERATED {n1, n2, n4, spare1}, crs-PortsCount-r11 crs-FreqShift-r11 INTEGER (0..5), mbsfn-SubframeConfigList-r11 CHOICE { release NULL. SEQUENCE { setup

subframeConfigList MBSFN-SubframeConfigList } } OPTIONAL, -- Need ON ENUMERATED {reserved, n1, n2, n3, n4, assigned} pdsch-Start-r11 } OPTIONAL, -- Need OP csi-RS-ConfigZPId-r11 CSI-RS-ConfigZPId-r11, csi-RS-ConfigZPld-rll CSI-RS-ConfigZPld-rll, qcl-CSI-RS-ConfigNZPld-rll CSI-RS-ConfigNZPld-rll OPTIONAL, -- Need OR [[ mbsfn-SubframeConfigList-v1430 CHOICE { release NULL, SEQUENCE { setup subframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 } } OPTIONAL -- Need OP ]], [[ codewordOneConfig-v1530 CHOICE { NULL, release setup SEQUENCE { ENUMERATED {n1, n2, n4, spare1}, crs-PortsCount-v1530 crs-FreqShift-v1530 INTEGER (0..5), mbsfn-SubframeConfigList-v1530 mbsfn-SubframeConfigList-v1530MBSFN-SubframeConfigListOPTIONAL,mbsfn-SubframeConfigListExt-v1530MBSFN-SubframeConfigList-v1430OPTIONAL,mbsfn-SubframeConfigListExt-v1530MBSFN-SubframeConfigList-v1430OPTIONAL, MBSFN-SubframeConfigList pdsch-Start-v1530 ENUMERATED {reserved, n1, n2, n3, n4, assigned}, csi-RS-ConfigZPId-v1530 CSI-RS-ConfigZPId-r11, qcl-CSI-RS-ConfigNZPId-v1530 CSI-RS-ConfigNZPId-r11 OPTIONAL } OPTIONAL -- Cond TypeC } ]] } -- ASN1STOP

#### **PDSCH-Config field descriptions**

#### altMCS-TableScalingConfig

Presence of the field indicates activation of 6-bit MCS table (i.e., *altMCS-Table*) for UE indicating support for *altMCS-Table*, see TS 36.212 [22] and TS 36.213 [23]. The indicated value configures the parameter *altMCS-Table-Scaling* where value oDot5 corresponds to scaling factor 0.5, value oDot625 corresponds to scaling factor 0.625 and so on, see TS 36.213 [23].

### ce-CQI-AlternativeTableConfig

Configures the UE supporting alternative CQI table to use the alternative CQI table in CE mode A. See TS 36.213 [23].

#### ce-HARQ-AckBundling

Activation of PDSCH HARQ-ACK bundling in half duplex FDD in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. ce-PDSCH-64QAM-Config

Activation of 64 QAM for non-repeated unicast PDSCH in CE mode A.

### ce-PDSCH-FlexibleStartPRB-AllocConfig

Activation of flexible starting PRB for PDSCH resource allocation in CE mode A or B. E-UTRAN does not configure this field when E-UTRA system bandwidth is 1.4 MHz.

#### ce-PDSCH-MaxBandwidth

Maximum PDSCH channel bandwidth in CE mode A and B, see TS 36.212 [22] and TS 36.213 [23]. Value bw5 corresponds to 5 MHz, and value bw20 corresponds to 20 MHz. If this field is absent, the UE shall release any existing value and set the maximum PDSCH channel bandwidth in CE mode A and B to 1.4 MHz. Parameter: transmission bandwidth configuration, see TS 36.101 [42], table 5.6-1. The max bandwidth can by configured to 5MHz for BL UEs and 5MHz or 20MHz for UEs in CE.

#### ce-PDSCH-TenProcesses

Configuration of 10 (instead of 8) DL HARQ processes in FDD in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. ce-SchedulingEnhancement

Activation of dynamic HARQ-ACK delay for HD-FDD for PDSCH in CE mode A controlled by the DCI, see TS 36.212 [22] and TS 36.213 [23]. Value range1 corresponds to the first range of HARQ-ACK delays, and value range2 corresponds to second range of HARQ-ACK delays.

#### codewordOneConfig

The field corresponds to codeword 1, see TS 36.213 [23], clause 7.1.10. If absent, the UE applies the values from the serving cell configured on the same frequency.

#### mbsfn-SubframeConfigList

Indicates the MBSFN configuration for the CSI-RS resources. If *optionalSetOfFields* is absent, the fields *mbsfn-SubframeConfigList-r11* and *mbsfn-SubframeConfigList-v1430* are released.

#### optionalSetOfFields

If absent, the UE releases the configuration provided previously, if any, and applies the values from the serving cell configured on the same frequency. If the UE is configured with *qcl-Operation-v1530*, this field corresponds to codeword 0, see TS 36.213 [23], clause 7.1.10.

#### р-а

Parameter:  $P_A$ , see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc.

p-b

Parameter:  $P_B$ , see TS 36.213 [23], clause Table 5.2-1.

#### pdsch-maxNumRepetitionCEmodeA

Maximum value to indicate the set of PDSCH repetition numbers for CE mode A, see TS 36.211 [21] and TS 36.213 [23].

### pdsch-maxNumRepetitionCEmodeB

Maximum value to indicate the set of PDSCH repetition numbers for CE mode B, see TS 36.211 [21] and TS 36.213 [23].

### pdsch-Start

The starting OFDM symbol of PDSCH for the concerned serving cell, see TS 36.213 [23], clause 7.1.6.4. Values 1, 2, 3 are applicable when *dl-Bandwidth* for the concerned serving cell is greater than 10 resource blocks, values 2, 3, 4 are applicable when *dl-Bandwidth* for the concerned serving cell is less than or equal to 10 resource blocks, see TS 36.211 [21], Table 6.7-1. Value *n1* corresponds to 1, value *n2* corresponds to 2 and so on. If the field *pdsch-Start-v1530* is also configured, E-UTRAN ensures that this value is the same as *pdsch-Start* (i.e., without suffix).

## qcl-CSI-RS-ConfigNZPId

Indicates the CSI-RS resource that is quasi co-located with the PDSCH antenna ports, see TS 36.213 [23], clause 7.1.9. E-UTRAN configures this field if and only if the UE is configured with *qcl-Operation* set to *typeB* or *qcl-Operation-v1530* set to *typeC*. If the UE is configured with *qcl-Operation-v1530* set to *typeC*, the field *qcl-CSI-RS-ConfigNZPId-r11* corresponds to codeword 0, and the field *qcl-CSI-RS-ConfigNZPId-v1530* corresponds to codeword 1, see TS 36.213 [23], clause 7.1.10..

### qcl-Operation

Indicates the quasi co-location behaviour to be used by the UE, type A, type B, or type C, as described in TS 36.213 [23], clause 7.1.10. In case *qcl-Operation-v1530* is present, the UE shall ignore the field *qcl-Operation* (without suffix). E-UTRAN configures *qcl-Operation-v1530* only when transmission mode 10 is configured for the serving cell on this carrier frequency and QCL type C is configured.

PDSCH-Config field descriptions				
altMCS-TableScalingConfig				
Presence of the field indicates activation of 6-bit MCS table (i.e., altMCS-Table) for UE indicating support for altMCS-				
Table, see TS 36.212 [22] and TS 36.213 [23]. The indicated value configures the parameter altMCS-Table-Scaling				
where value oDot5 corresponds to scaling factor 0.5, value oDot625 corresponds to scaling factor 0.625 and so on,				
see TS 36.213 [23].				
ce-CQI-AlternativeTableConfig				
Configures the UE supporting alternative CQI table to use the alternative CQI table in CE mode A. See TS 36.213 [23].				
ce-HARQ-AckBundling				
Activation of PDSCH HARQ-ACK bundling in half duplex FDD in CE mode A, see TS 36.212 [22] and TS 36.213 [23].				
ce-PDSCH-64QAM-Config				
Activation of 64 QAM for non-repeated unicast PDSCH in CE mode A.				
referenceSignalPower				
Parameter: Reference-signal power, which provides the downlink reference-signal EPRE, see TS 36.213 [23], clause				
5.2. The actual value in dBm.				
re-MappingQCLConfigToAddModList, re-MappingQCLConfigToReleaseList				
For a serving frequency E-UTRAN configures at least one PDSCH-RE-MappingQCL-Config when transmission mode				
10 is configured for the serving cell on this carrier frequency. Otherwise it does not configure this field.				
tbsIndexAlt				
Indicates the applicability of the alternative TBS index for the I _{TBS} 26 and 33 (see TS 36.213 [23], Table 7.1.7.2.1-1), to				
all subframes scheduled by DCI format 2C or 2D. Value a26 refers to the alternative TBS index ITBS 26A, and value				
a33 refers to the alternative TBS index I _{TBS} 33A. If this field is not configured, the UE shall use I _{TBS} 26 specified in				
Table 7.1.7.2.1-1 in TS 36.213 [23] for all subframes instead. If neither this field nor tbsIndexAlt2 configures an				
alternative TBS index for ITBS 33, the UE shall use ITBS 33 specified in Table 7.1.7.2.1-1 in TS 36.213 [23] for all				
subframes instead.				
tbsIndexAlt2				
Indicates the applicability of the alternative TBS index for the $h_{\text{TBS}}$ 33 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all				
subframes. Value b33 refers to the alternative TBS index <i>I</i> _{TBS} 33B. If neither this field nor <i>tbsIndexAlt</i> configures an				
alternative TBS index for $h_{\text{BS}}$ 33, the UE shall use $h_{\text{BS}}$ 33 specified in Table 7.1.7.2.1-1 in TS 36.213 [23] for all				
subframes instead.				
tbs-IndexAlt3				
Indicates the applicability of the alternative TBS index for the $h_{\text{TBS}}$ 37 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all subframes. Value a37 refers to the alternative TBS index $h_{\text{TBS}}$ 37A.				

Conditional presence	Explanation	
ТуреС	The field is optional, need ON when <i>qcl-Operation</i> is configured with <i>typeC</i> . Otherwise the	
	field is not present and the UE shall delete any existing value for this field.	

## PDSCH-RE-MappingQCL-ConfigId

The IE *PDSCH-RE-MappingQCL-ConfigId* is used to identify a set of PDSCH parameters related to resource element mapping and quasi co-location, as configured by the IE *PDSCH-RE-MappingQCL-Config*. The identity is unique within the scope of a carrier frequency.

### PDSCH-RE-MappingQCL-ConfigId information elements

ASN1START	
PDSCH-RE-MappingQCL-ConfigId-rll ::=	INTEGER (1maxRE-MapQCL-r11)
ASN1STOP	

PerCC-GapIndicationList

The IE PerCC-GapIndicationList is used to specify the UE measurement gap preference.

### PerCC-GapIndication information elements

```
-- ASN1START
PerCC-GapIndicationList-r14 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF PerCC-GapIndication-r14
PerCC-GapIndication-r14 ::= SEQUENCE {
    servCellId-r14 ServCellIndex-r13,
```

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gapIndication-r14

ENUMERATED {gap, ncsg, nogap-noNcsg}

#### -- ASN1STOP

}

#### PerCC-GapIndication field descriptions

#### servCellId

This field identifies the serving cell for which the measurement gap perference is provided.

#### gapIndication

This field is used to indicate the measurement gap preference per component carrier (serving cell) by the UE both in non-CA and CA configurations. Value *gap* indicates that a measurement gap is needed for the associated *servCellId*, value *nogap-noNcsg* indicates that neither a measurement gap nor a ncsg is needed for the associated *servCellId*, value *ncsg* indicates that ncsg is needed for the associated *servCellId*. The UE shall indicate the per CC measurement gap preference consistently for the same non-CA or CA configuration and measurement configuration during the same RRC connection.

### PHICH-Config

The IE PHICH-Config is used to specify the PHICH configuration.

### **PHICH-Config** information element

```
-- ASN1START
PHICH-Config ::= SEQUENCE {
    phich-Duration ENUMERATED {normal, extended},
    phich-Resource ENUMERATED {oneSixth, half, one, two}
}
-- ASN1STOP
```

PHICH-Config field descriptions				
phich-Duration				
Parameter: PHICH-Duration, see TS 36.211 [21], Table 6.9.3-1.				
phich-Resource				
Parameter: Ng, see TS 36.211 [21], clause 6.9. Value oneSixth corresponds to 1/6, half corresponds to 1/2 and so on.				

### PhysicalConfigDedicated

The IE PhysicalConfigDedicated is used to specify the UE specific physical channel configuration.

### PhysicalConfigDedicated information element

	ASN1START								
Phy	PhysicalConfigDedicated ::= SEQUENCE {								
-	pdsch-ConfigDedicated	PDSCH-ConfigDedicated	OPTIONAL,	Need ON					
	pucch-ConfigDedicated	PUCCH-ConfigDedicated	OPTIONAL,	Need ON					
	pusch-ConfigDedicated	PUSCH-ConfigDedicated	OPTIONAL,	Need ON					
	uplinkPowerControlDedicated	UplinkPowerControlDedicated	OPTIONAL,	Need ON					
	tpc-PDCCH-ConfigPUCCH	TPC-PDCCH-Config	OPTIONAL,	Need ON					
	tpc-PDCCH-ConfigPUSCH	TPC-PDCCH-Config	OPTIONAL,	Need ON					
	cqi-ReportConfig	CQI-ReportConfig	OPTIONAL,	Cond CQI-					
r8									
	soundingRS-UL-ConfigDedicated	SoundingRS-UL-ConfigDedicated	OPTIONAL,	Need ON					
	antennaInfo	CHOICE {							
	explicitValue	AntennaInfoDedicated,							
	defaultValue	NULL							
	}		OPTIONAL,	Cond AI-r8					
	schedulingRequestConfig	SchedulingRequestConfig	OPTIONAL,	Need ON					
	,		00000000	a 1 aaz					
	[[ cqi-ReportConfig-v920	CQI-ReportConfig-v920	OPTIONAL,	Cond CQI-					
r8	antennaInfo-v920	AntennaInfoDedicated-v920	OPTIONAL	Cond AI-					
r8	ancennarin 0-V920	Ancennarin ODealCalea-V920	OFIIONAL	Cond AI-					
то	]],								
	]], [[ antennaInfo-r10	CHOICE {							

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		7	anna Trafa Dadi satad al 0				
	explicitValue-r10 AntennaInfoDedicated-r10, defaultValue NULL						
	} antennaInfoUL-r10 AntennaInfoUL-r10		OPTIONAL,	Cond	AI-r1	0	
			InfoUL-r10	OPTIONAL,		Jeed 0	
cif-Presence-r10 BOOLE cqi-ReportConfig-r10 CQI-R				OPTIONAL,		Jeed 0	
					Cond		
	csi-RS-Config-r10		Config-r10	OPTIONAL,		Jeed O	
	pucch-ConfigDedicated-v1020		onfigDedicated-v1020	OPTIONAL,		Jeed O	
	pusch-ConfigDedicated-v1020		onfigDedicated-v1020	OPTIONAL,		Jeed O	
	schedulingRequestConfig-v102		ingRequestConfig-v1020	OPTIONAL,	N	leed 0	)N
	soundingRS-UL-ConfigDedicate						
			onfigDedicated-v1020	OPTIONAL,	N	Jeed O	)N
	soundingRS-UL-ConfigDedicate						
	-		gDedicatedAperiodic-r10	OPTIONAL,	N	Jeed O	)N
	uplinkPowerControlDedicated-						
	1	UplinkPower	ControlDedicated-v1020	OPTIONAL	N	Jeed O	)N
]],							
[[	additionalSpectrumEmissionCA	-r10	CHOICE {				
	release		NULL,				
	setup		SEQUENCE {				
	additionalSpectrumEm	issionPCell	-r10 AdditionalSpects	rumEmission			
	}						
	} OPTIONAL N	eed ON					
]],							
	DL configuration as well a	as configur	ation applicable for DL a	and UL			
	csi-RS-ConfigNZPToReleaseLis						
	-		igNZPToReleaseList-r11	OPTIONAL,	N	Jeed O	N
	csi-RS-ConfigNZPToAddModList	-r11					
			igNZPToAddModList-r11	OPTIONAL,	N	Jeed O	N
	csi-RS-ConfigZPToReleaseList						
	3		igZPToReleaseList-r11	OPTIONAL,	N	Jeed O	N
	csi-RS-ConfigZPToAddModList-		-			Jeed O	
	epdcch-Config-r11		Config-r11	OPTIONAL,		Veed 0	
	pdsch-ConfigDedicated-v1130		onfigDedicated-v1130	OPTIONAL,		Veed 0	
T	JL configuration			,	_		
,	cqi-ReportConfig-v1130	COI-Rep	ortConfig-v1130	OPTIONAL,	N	Jeed O	M
	pucch-ConfigDedicated-v1130		onfigDedicated-v1130	OPTIONAL,		Jeed 0	
	pusch-ConfigDedicated-v1130		onfigDedicated-v1130	OPTIONAL,		Jeed 0	
			onrightateatea viibu	OI IIONAL,	1	iccu o	11
	uplinkPowerControlDedicated-v1130		ControlDedicated-v1130	OPTIONAL	N	Jeed O	M
11		opiinnowci	controlibearcatea virsu	OLITOWAR	1	iccu o	11
	]], [[ antennaInfo-v1250		InfoDedicated-v1250	OPTIONAL,	Cond	λτ_ <b>γ</b> 1	0
	eimta-MainConfig-r12		ainConfig-r12	OPTIONAL,		Jeed 0	
	eimta-MainConfigPCell-r12		ainConfigServCell-r12	OPTIONAL,		veed 0 Veed 0	
				OPTIONAL,		veed 0 Veed 0	
	pucch-ConfigDedicated-v1250 PUCCH-ConfigDedicated-v1250 cqi-ReportConfigPCell-v1250 CQI-ReportConfig-v1250		OPTIONAL,		veed 0 Veed 0		
			OPIIONAL,	I	ieed 0	)IN	
	uplinkPowerControlDedicated-v1250 UplinkPowerControlDedicated-v1250			ODUTONNT		Teed C	744
		-		OPTIONAL,		Jeed O	
	pusch-ConfigDedicated-v1250		onfigDedicated-v1250	OPTIONAL,		Jeed O	
	csi-RS-Config-v1250	CSI	-RS-Config-v1250	OPTIONAL	N	Jeed O	N
	]],						
] ]	pdsch-ConfigDedicated-v1280	PDS	CH-ConfigDedicated-v1280	OPTIONAL	N	Jeed O	N
]],							
]]	pdsch-ConfigDedicated-v1310		CH-ConfigDedicated-v1310			leed 0	
	pucch-ConfigDedicated-r13		CH-ConfigDedicated-r13	OPTIONAL,		leed 0	
	pusch-ConfigDedicated-r13		CH-ConfigDedicated-r13	OPTIONAL,	N	leed 0	N
	pdcch-CandidateReductions-r1						
		PDCCH-C	andidateReductions-r13	OPTIONAL,		leed O	
	cqi-ReportConfig-v1310 CQI-ReportConfig-v1310		OPTIONAL,	N	Jeed O	N	
	soundingRS-UL-ConfigDedicated-v1310 SoundingRS-UL-ConfigDedicated-v1310 soundingRS-UL-ConfigDedicatedUpPTsExt-r13 SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 soundingRS-UL-ConfigDedicatedAperiodic-v1310 SoundingRS-UL-ConfigDedicatedAperiodic-v1310 soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13						
				OPTIONAL,	N	leed O	N
				OPTIONAL,	N	Jeed O	)N
				OPTIONAL,	N	Jeed O	N
	SoundingRS-UL-Config	RS-UL-ConfigDedicatedAperiodicUpPTsExt-r13		OPTIONAL,	N	Jeed O	N
	csi-RS-Config-v1310			OPTIONAL,	N	Need O	N
		e-r13 CHOICE {					
	release						
	setup ENUMERATED {ce-ModeA,ce-ModeB}						
				OPTIONAL,	N	Jeed O	DN
						Ne	
ON							
				seListExt-r13	OPTI	IONAL	
Need ON							
]],							
]]	cqi-ReportConfig-v1320		CQI-ReportConfig-v1320	OPTIONAL	N	Jeed O	N

11, [[ typeA-SRS-TPC-PDCCH-Group-r14 CHOICE { NULL, release SEQUENCE (SIZE (1..32)) OF SRS-TPC-PDCCH-Config-r14 setup OPTIONAL, -- Need ON must-Config-r14 CHOICE { release NULL. SEOUENCE { setup k-max-r14 ENUMERATED {11, 13}, p-a-must-r14 ENUMERATED { dB-6, dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3} OPTIONAL -- Need ON } OPTIONAL, -- Need ON pusch-EnhancementsConfig-r14 PUSCH-EnhancementsConfig-r14 OPTIONAL, -- Need ON ce-pdsch-pusch-EnhancementConfig-r14 ENUMERATED {on} OPTIONAL, -- Need OR antennaInfo-v1430AntennaInfoDedicated-v1430OPTIONAL,--Need ONpucch-ConfigDedicated-v1430PUCCH-ConfigDedicated-v1430OPTIONAL,--Need ONpdsch-ConfigDedicated-v1430PDSCH-ConfigDedicated-v1430OPTIONAL,--Need ONpusch-ConfigDedicated-v1430PDSCH-ConfigDedicated-v1430OPTIONAL,--Need ONpusch-ConfigDedicated-v1430PUSCH-ConfigDedicated-v1430OPTIONAL,--Need ON -- Need ON soundingRS-UL-PeriodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-UL-ConfigDedicated OPTIONAL, -- Cond PeriodicSRSPCell soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF 

 SoundingRS-UL-ConfigDedicatedUpPTsExt-r13
 OPTIONAL,
 -- Cond PeriodicSRSExt

 soundingRS-UL-AperiodicConfigDedicatedList-r14
 SEQUENCE (SIZE (1..2)) OF

 SoundingRS-UL-ConfigDedicatedAperiodic-r10
 OPTIONAL,
 -- Cond AperiodicSRS

 soundingRS-UL-ConfigDedicatedApUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Cond AperiodicSRSExt csi-RS-ConfigZP-ApList-r14 cqi-ReportConfig-w1420 CSI-RS-Config-v1430 OPTIONAL, -- Need ON CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need ON CQI-ReportConfig-v1430 OPTIONAL, -- Need ON semiOpenLoop-r14 BOOLEAN OPTIONAL -- Need ON ]], [[ csi-RS-Config-v1480 CSI-RS-Config-v1480 OPTIONAL -- Need ON 11, [[ physicalConfigDedicatedSTTI-r15 PhysicalConfigDedicatedSTTI-r15 OPTIONAL,-- Need ON pdsch-ConfigDedicated-v1530PDSCH-ConfigDedicated-v1530OPTIONAL, --Need ONpusch-ConfigDedicated-v1530PUSCH-ConfigDedicated-v1530OPTIONAL, --Need ONcqi-ReportConfig-v1530CQI-ReportConfig-v1530OPTIONAL, --Need ONortennalnfo-v1530CQI-ReportConfig-v1530OPTIONAL, --Need ON PUSCH-ConfigDedicated viewOPTIONAL, -- Need ONCQI-ReportConfig-v1530OPTIONAL, -- Need ONAntennaInfoDedicated-v1530OPTIONAL, -- Need ONOPTIONAL, -- Need ONOPTIONAL, -- Need ON antennaInfo-v1530 csi-RS-Config-v1530 semiStaticCFI-Config-r15 UplinkPowerControlDedicated-v1530 OPTIONAL, CHOICE{ uplinkPowerControlDedicated-v1530 -- Need ON NULL, release upCHOICE {cfi-Config-r15CFI-Config-r15,cfi-PatternConfig-r15CFI-PatternConf CHOTCE { setup CFI-PatternConfig-r15 } OPTIONAL, -- Need ON blindPDSCH-Repetition-Config-r15 CHOICE { release NULL, SEQUENCE { setup blindSubframePDSCH-Repetitions-r15 BOOLEAN, blindSlotSubslotPDSCH-Repetitions-r15 BOOLEAN, maxNumber-SubframePDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON maxNumber-SlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, --Need ON rv-SubframePDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, --Need ON rv-SlotsublotPDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, --Need ON numberOfProcesses-SubframePDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON numberOfProcesses-SlotSubslotPDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, --Need ON mcs-restrictionSubframePDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL, --Need ON mcs-restrictionSlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL -- Need ON } } OPTIONAL -- Need ON 11, spucch-Config-v1550 SPUCCH-Config-v1550 ]]] OPTIONAL -- Need ON ]] } PhysicalConfigDedicated-v1370 ::= SEQUENCE {

```
pucch-ConfigDedicated-v1370 PUCCH-ConfigDedicated-v1370 OPTIONAL
                                                                                     -- Cond
PUCCH-Format4or5
}
PhysicalConfigDedicated-v13c0 ::= SEQUENCE {
   pucch-ConfigDedicated-v13c0
                                  PUCCH-ConfigDedicated-v13c0
PhysicalConfigDedicatedSCell-r10 ::=
                                        SEQUENCE {
    -- DL configuration as well as configuration applicable for DL and UL
   nonUL-Configuration-r10
                                         SEQUENCE {
       antennaInfo-r10
                                          AntennaInfoDedicated-r10 OPTIONAL,
                                                                                     -- Need ON
       crossCarrierSchedulingConfig-r10
                           CrossCarrierSchedulingConfig-r10
                                                                     OPTIONAL,
                                                                                     -- Need ON
       csi-RS-Config-r10
                                             CSI-RS-Config-r10
                                                                     OPTIONAL,
                                                                                     -- Need ON
       pdsch-ConfigDedicated-r10
                                              PDSCH-ConfigDedicated OPTIONAL
                                                                                     -- Need ON
                                                                      OPTIONAL,
                                                                                 -- Cond SCellAdd
   }
     - UL configuration
   ul-Configuration-r10
                                          SEOUENCE {
       antennaInfoUL-r10
                                              AntennaInfoUL-r10
                                                                     OPTIONAL,
                                                                                    -- Need ON
       pusch-ConfigDedicatedSCell-r10
                              PUSCH-ConfigDedicatedSCell-r10 OPTIONAL, -- Cond PUSCH-SCell1
       uplinkPowerControlDedicatedSCell-r10
                                                                     OPTIONAL,
                              UplinkPowerControlDedicatedSCell-r10
                                                                                     -- Need ON
                                          CQI-ReportConfigSCell-r10
       cqi-ReportConfigSCell-r10
                                                                     OPTIONAL,
                                                                                     -- Need ON
       soundingRS-UL-ConfigDedicated-r10
                                      SoundingRS-UL-ConfigDedicated OPTIONAL,
                                                                                     -- Need ON
       soundingRS-UL-ConfigDedicated-v1020
                                  SoundingRS-UL-ConfigDedicated-v1020 OPTIONAL,
                                                                                    -- Need ON
       soundingRS-UL-ConfigDedicatedAperiodic-r10
                          SoundingRS-UL-ConfigDedicatedAperiodic-r10 OPTIONAL
                                                                                 -- Need ON
                                                                     OPTIONAL,
   }
                                                                                 -- Cond CommonUL
    [[ -- DL configuration as well as configuration applicable for DL and UL
       csi-RS-ConfigNZPToReleaseList-r11
                                  CSI-RS-ConfigNZPToReleaseList-r11 OPTIONAL,
                                                                                     -- Need ON
       csi-RS-ConfigNZPToAddModList-r11
                                  CSI-RS-ConfigNZPToAddModList-r11
                                                                     OPTIONAL,
                                                                                     -- Need ON
       csi-RS-ConfigZPToReleaseList-r11
                                  CSI-RS-ConfigZPToReleaseList-r11
                                                                     OPTIONAL,
                                                                                     -- Need ON
       csi-RS-ConfigZPToAddModList-r11
                                      CSI-RS-ConfigZPToAddModList-r11 OPTIONAL,
                                                                                     -- Need ON
       epdcch-Config-r11
                                          EPDCCH-Config-r11
                                                                      OPTIONAL,
                                                                                     -- Need ON
                                                                                     -- Need ON
       pdsch-ConfigDedicated-v1130
                                          PDSCH-ConfigDedicated-v1130 OPTIONAL,
    -- UL configuration
       cqi-ReportConfig-v1130
                                          CQI-ReportConfig-v1130
                                                                                     -- Need ON
                                                                     OPTIONAL,
       pusch-ConfigDedicated-v1130
                                  PUSCH-ConfigDedicated-v1130 OPTIONAL, -- Cond PUSCH-SCell1
       uplinkPowerControlDedicatedSCell-v1130
                                  UplinkPowerControlDedicated-v1130 OPTIONAL
                                                                                     -- Need ON
    1],
    [[ antennaInfo-v1250
                                          AntennaInfoDedicated-v1250 OPTIONAL,
                                                                                     -- Need ON
       eimta-MainConfigSCell-r12
                                      EIMTA-MainConfigServCell-r12
                                                                     OPTIONAL,
                                                                                     -- Need ON
       cqi-ReportConfigSCell-v1250
                                          CQI-ReportConfig-v1250
                                                                     OPTIONAL,
                                                                                     -- Need ON
       uplinkPowerControlDedicatedSCell-v1250
                                 UplinkPowerControlDedicated-v1250 OPTIONAL,
                                                                                     -- Need ON
       csi-RS-Config-v1250
                                          CSI-RS-Config-v1250
                                                                     OPTIONAL
                                                                                     -- Need ON
   11,
   [[ pdsch-ConfigDedicated-v1280
                                          PDSCH-ConfigDedicated-v1280 OPTIONAL
                                                                                     -- Need ON
    ]],
   [[ pucch-Cell-r13
                                          ENUMERATED {true}
                                                                OPTIONAL, -- Cond PUCCH-SCell1
       pucch-SCell
                                          CHOICE {
           release
                                              NITT.T.
                                              SEQUENCE {
           setup
               pucch-ConfigDedicated-r13
                                          PUCCH-ConfigDedicated-r13 OPTIONAL,
                                                                                     -- Need ON
               schedulingRequestConfig-r13
                                  SchedulingRequestConfigSCell-r13
                                                                     OPTIONAL,
                                                                                     -- Need ON
               tpc-PDCCH-ConfigPUCCH-SCell-r13
                                          TPC-PDCCH-ConfigSCell-r13 OPTIONAL,
                                                                                     -- Need ON
               pusch-ConfigDedicated-r13
                                      PUSCH-ConfigDedicated-r13 OPTIONAL, -- Cond PUSCH-SCell
               uplinkPowerControlDedicated-r13
                              UplinkPowerControlDedicatedSCell-v1310 OPTIONAL
                                                                                 -- Need ON
           }
                                                                    OPTIONAL, -- Need ON
```

crossCarrierSchedulingConfig-r13 CrossCarrierSchedulingConfig-r13OPTIONAL,-- Cond Cross-Cpdcch-ConfigSCell-r13PDCCH-ConfigSCell-r13OPTIONAL,cqi-ReportConfig-v1310CQI-ReportConfig-v1310OPTIONAL,pdsch-ConfigDedicated-v1310PDSCH-ConfigDedicated-v1310OPTIONAL, -- Cond Cross-Carrier-Config -- Need ON -- Need ON -- Need ON soundingRS-UL-ConfigDedicated-v1310 SoundingRS-UL-ConfigDedicated-v1310 OPTIONAL. -- Need ON soundingRS-UL-ConfigDedicatedUpPTsExt-r13 SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Need ON soundingRS-UL-ConfigDedicatedAperiodic-v1310 SoundingRS-UL-ConfigDedicatedAperiodic-v1310 OPTIONAL, -- Need ON soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 OPTIONAL, -- Need ON CSI-RS-Config-v1310 csi-RS-Config-v1310 OPTIONAL, -- Need ON laa-SCellConfiguration-r13 LAA-SCellConfiguration-r13 OPTIONAL, -- Need ON csi-RS-ConfigNZPToAddModListExt-r13 CSI-RS-ConfigNZPToAddModListExt-r13 OPTIONAL, -- Need ON csi-RS-ConfigNZPToReleaseListExt-r13 CSI-RS-ConfigNZPToReleaseListExt-r13 OPTIONAL --Need ON ]], CQI-ReportConfig-v1320 OPTIONAL cqi-ReportConfig-v1320 -- Need ON 11 ]], laa-SCellConfiguration-v1430 LAA-SCellConfiguration-v1430 [[ OPTIONAL, -- Need ON typeB-SRS-TPC-PDCCH-Config-r14 SRS-TPC-PDCCH-Config-r14 OPTIONAL, -- Need ON uplinkPUSCH-LessPowerControlDedicated-v1430 UplinkPUSCH-LessPowerControlDedicated-v1430 OPTIONAL, -- Need ON soundingRS-UL-PeriodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF RS-UL-ConfigDedicated OPTIONAL, -- Cond soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList-r14 SoundingRS-UL-ConfigDedicated -- Cond PeriodicSRS SEQUENCE (SIZE (1..4)) OF SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 OPTIONAL, -- Cond OPTIONAL, -- Cond AperiodicSRS List-r14 SEQUENCE (SIZ PeriodicSRSExt soundingRS-UL-AperiodicConfigDedicatedList-r14 SEQUENCE (SIZE (1..2)) OF SoundingRS-AperiodicSet-r14 soundingRS-UL-ConfigDedicatedApUpPTsExtList-r14 SEQUENCE (SIZE (1..4)) OF SoundingRS-AperiodicSetUpPTsExt-r14 -- Cond AperiodicSRSExt must-Config-r14 CHOICE { release NULL, SEQUENCE { setup k-max-r14 ENUMERATED {11, 13}, p-a-must-r14 ENUMERATED { dB-6, dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3} OPTIONAL -- Need ON } OPTIONAL, -- Need ON PUSCH-ConfigDedicatedSCell-v1430 OPTIONAL, -- Need pusch-ConfigDedicated-v1430 ON CSI-RS-Config-v1430 OPTIONAL, -- Need ON CSI-RS-ConfigZP-ApList-r14 OPTIONAL, -- Need csi-RS-Config-v1430 csi-RS-ConfigZP-ApList-r14 ON cqi-ReportConfig-v1430 CQI-ReportConfig-v1430 OPTIONAL, -- Need ON semiOpenLoop-r14 BOOLEAN OPTIONAL, -- Need ON PDSCH-ConfigDedicatedSCell-v1430 pdsch-ConfigDedicatedSCell-v1430 OPTIONAL -- Need ON ]], [[ csi-RS-Config-v1480 CSI-RS-Config-v1480 OPTIONAL -- Need ON 11, [ physicalConfigDedicatedSTTI-r15 PhysicalConfigDedicatedSTTI-r15 OPTIONAL, -- Need ON PDSCH-ConfigDedicated-v1530 OPTIONAL, CQI-ReportConfig-v1530 OPTIONAL, CQI-ReportConfigSCell-r15 OPTIONAL, CQI-ShortConfigSCell-r15 OPTIONAL, pdsch-ConfigDedicated-v1530 -- Need ON -- Need ON dummy cqi-ReportConfigSCell-r15 -- Need ON cqi-ShortConfigSCell-r15 -- Need ON csi-RS-Config-v1530 CSI-RS-Config-v1530 OPTIONAL. -- Need ON uplinkPowerControlDedicatedSCell-v1530 UplinkPowerControlDedicated-v1530 OPTIONAL, -- Need ON LAA-SCellConfiguration-v1530 OPTIONAL, -- Need ON laa-SCellConfiguration-v1530 pusch-ConfigDedicated-v1530 PUSCH-ConfigDedicatedScell-v1530 OPTIONAL, -- Cond AUL semiStaticCFI-Config-r15 CHOICE { release NULL, setup CHOICE { CFI-Config-r15, cfi-Config-r15 cfi-PatternConfig-r15 CFI-PatternConfig-r15 } -- Need ON OPTIONAL, blindPDSCH-Repetition-Config-r15 CHOICE { release NULL,

}

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SEQUENCE { setup blindSubframePDSCH-Repetitions-r15 BOOLEAN, blindSlotSubslotPDSCH-Repetitions-r15 BOOLEAN, maxNumber-SubframePDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, -- Need ON maxNumber-SlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n4,n6} OPTIONAL, --Need ON rv-SubframePDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, --Need ON rv-SlotsublotPDSCH-Repetitions-r15 ENUMERATED {dlrvseq1, dlrvseq2} OPTIONAL, --Need ON numberOfProcesses-SubframePDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, -- Need ON numberOfProcesses-SlotSubslotPDSCH-Repetitions-r15 INTEGER(1..16) OPTIONAL, --Need ON mcs-restrictionSubframePDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL, --Need ON mcs-restrictionSlotSubslotPDSCH-Repetitions-r15 ENUMERATED {n0, n1} OPTIONAL -- Need ON } } OPTIONAL -- Need ON ]], SPUCCH-Config-v1550 spucch-Config-v1550 OPTIONAL -- Need ON [[ ]] } PhysicalConfigDedicatedSCell-v1370 ::= SEQUENCE { pucch-SCell-v1370 CHOICE { release NULL setup SEQUENCE { pucch-ConfigDedicated-v1370 PUCCH-ConfigDedicated-v1370 OPTIONAL -- Cond PUCCH-Format4or5 } } } PhysicalConfigDedicatedSCell-v13c0 ::= SEQUENCE { pucch-SCell-v13c0 CHOICE { release NULL SEQUENCE { setup pucch-ConfigDedicated-v13c0 PUCCH-ConfigDedicated-v13c0 } } } CFI-Config-r15 := SEQUENCE { cfi-SlotSubslotNonMBSFN-r15 INTEGER (1..4) cfi-SubframeMBSFN-r15 INTEGER (1..3) cfi-SlotSub-2 OPTIONAL, -- Need ON OPTIONAL, -- Need ON OPTIONAL, -- Need ON cfi-SlotSubslotMBSFN-r15 INTEGER (1..2) OPTIONAL -- Need ON } CFI-PatternConfig-r15 := SEQUENCE { cfi-PatternSubframe-r15 SEQUENCE (SIZE(10)) OF INTEGER (1..4) OPTIONAL, -- Need ON cfi-PatternSlotSubslot-r15 SEQUENCE (SIZE(10)) OF INTEGER (1..3) OPTIONAL -- Need ON } LAA-SCellConfiguration-r13 ::= subframeStartPosition-r13 SEOUENCE { ENUMERATED {s0, s07}, laa-SCellSubframeConfig-r13 BIT STRING (SIZE(8)) } SEQUENCE { LAA-SCellConfiguration-v1430 ::= crossCarrierSchedulingConfig-UL-r14 CHOICE { release NULL, SEQUENCE { setup crossCarrierSchedulingConfigLAA-UL-r14 CrossCarrierSchedulingConfigLAA-UL-r14 } OPTIONAL, -- Cond Cross-Carrier-ConfigUL OPTIONAL, ĺbt-Config-r14 LBT-Config-r14 -- Need ON PDCCH-ConfigLAA-r14 OPTIONAL, pdcch-ConfigLAA-r14 -- Need ON absenceOfAnyOtherTechnology-r14 -- Need OR ENUMERATED {true} OPTIONAL, soundingRS-UL-ConfigDedicatedAperiodic-v1430 SoundingRS-UL-ConfigDedicatedAperiodic-v1430 OPTIONAL -- Need ON } LAA-SCellConfiguration-v1530 ::= SEQUENCE { OPTIONAL, aul-Config-r15 AUL-Config-r15 -- Need ON PUSCH-ModeConfigLAA-r15 OPTIONAL pusch-ModeConfigLAA-r15 -- Need OR

```
PUSCH-ModeConfigLAA-r15 ::=
                                       SEQUENCE {
        laa-PUSCH-Model BOOLEAN,
        laa-PUSCH-Mode2 BOOLEAN,
        laa-PUSCH-Mode3 BOOLEAN
}
LBT-Config-r14 ::=
                         CHOICE {
    maxEnergyDetectionThreshold-r14
                                                    INTEGER(-85..-52),
    energyDetectionThresholdOffset-r14
                                                    INTEGER(-13..20)
}
CSI-RS-ConfigNZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-ConfigNZP-
r11
CSI-RS-ConfigNZPToAddModListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-v1310)) OF CSI-RS-
ConfigNZP-r11
CSI-RS-ConfigNZPToAddModList-r15 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r13)) OF CSI-RS-ConfigNZP-
r11
CSI-RS-ConfigNZPToReleaseList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r11)) OF CSI-RS-
ConfigNZPId-r11
CSI-RS-ConfigNZPToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-v1310)) OF CSI-RS-
ConfigNZPId-v1310
CSI-RS-ConfigNZPToReleaseList-r15 ::= SEQUENCE (SIZE (1..maxCSI-RS-NZP-r13)) OF CSI-RS-
ConfigNZPId-r13
CSI-RS-ConfigZPToAddModList-r11 ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-r11)) OF CSI-RS-ConfigZP-r11
CSI-RS-ConfigZPToReleaseList-rll ::= SEQUENCE (SIZE (1..maxCSI-RS-ZP-rll)) OF CSI-RS-ConfigZPId-
r11
PhysicalConfigDedicatedSTTI-r15 ::= CHOICE {
    release
                              NULL,
    setup
                              SEQUENCE {
        antennaInfoDedicatedSTTI-r15
                                               AntennaInfoDedicatedSTTI-r15
                                                                                        OPTIONAL, -- Need ON
        antennaInfoUL-STTI-r15
                                                AntennaInfoUL-STTI-r15
                                                                                        OPTIONAL, -- Need ON
        antennaInfoUL-STTI-r15AntennaInfoUL-STTI-r15OPTIONAL, -- Need ONpucch-ConfigDedicated-v1530PUCCH-ConfigDedicated-v1530OPTIONAL, -- Need ONschedulingRequestConfig-v1530SchedulingRequestConfig-v1530OPTIONAL, -- Need ON
        pucch-ConfigDedicated-v1530
        uplinkPowerControlDedicatedSTTI-r15 UplinkPowerControlDedicatedSTTI-r15
                                                                                            OPTIONAL,
Need ON
        cqi-ReportConfig-r15
                                                CQI-ReportConfig-r15
                                                                                        OPTIONAL, -- Need ON
                                                                                        OPTIONAL, -- Need ON
        csi-RS-Config-r15
                                                CSI-RS-Config-r15
        csi-RS-ConfigNZPToReleaseList-r15 CSI-RS-ConfigNZPToReleaseList-r15 OPTIONAL, -- Need ON
        csi-RS-ConfigNZPToAddModList-r15 CSI-RS-ConfigNZPToAddModList-r15 OPTIONAL, -- Need ON
csi-RS-ConfigZPToReleaseList-r15 CSI-RS-ConfigZPToReleaseList-r11 OPTIONAL, -- Need ON
        csi-RS-ConfigZPToAddModList-r11
                                               CSI-RS-ConfigZPToAddModList-r11
                                                                                       OPTIONAL, -- Need ON
                                                                                        OPTIONAL, -- Need ON
        csi-RS-ConfigZP-ApList-r15
                                                CSI-RS-ConfigZP-ApList-r14
        eimta-MainConfig-r12
                                               EIMTA-MainConfig-r12
                                                                                        OPTIONAL, -- Need ON
        eimta-MainConfigServCell-r15
                                                                                        OPTIONAL, -- Need ON
                                                EIMTA-MainConfigServCell-r12
        semiOpenLoopSTTI-r15
                                                BOOLEAN,

    SemiopenLoopsili-iis
    Decellin,

    slotOrSubslotPDSCH-Config-r15
    SlotOrSubslotPDSCH-Config-r15

    slotOrSubslotPUSCH-Config-r15
    SlotOrSubslotPUSCH-Config-r15

                                                                                       OPTIONAL, -- Need ON
OPTIONAL, -- Need ON
        spdcch-Config-r15
                                                                                        OPTIONAL, -- Need ON
                                               SPDCCH-Config-r15
                                                                                        OPTIONAL, -- Need ON
        spucch-Config-r15
                                                SPUCCH-Config-r15
        srs-DCI7-TriggeringConfig-r15
                                               BOOLEAN.
        shortProcessingTime-r15
                                                BOOLEAN,
        shortTTI-r15
                                                ShortTTI-r15
                                                                                       OPTIONAL -- Need ON
    }
}
SoundingRS-AperiodicSet-r14 ::= SEQUENCE{
    srs-CC-SetIndexList-r14
                                   SEQUENCE (SIZE (1..4)) OF SRS-CC-SetIndex-r14
                                                                  OPTIONAL, -- Cond SRS-Trigger-TypeA
    soundingRS-UL-ConfigDedicatedAperiodic-r14
                                                     SoundingRS-UL-ConfigDedicatedAperiodic-r10
}
SoundingRS-AperiodicSetUpPTsExt-r14 ::= SEQUENCE{
    srs-CC-SetIndexList-r14
                                   SEQUENCE (SIZE (1..4)) OF SRS-CC-SetIndex-r14
                                                                  OPTIONAL, -- Cond SRS-Trigger-TypeA
    sounding {\tt RS-UL-ConfigDedicated} {\tt AperiodicUpPTsExt-r14}
```

}	SoundingRS-UL-ConfigDedic	catedAperiodic	UpPTsExt-r13
<pre>ShortTTI-r15 ::=     dl-STTI-Length-r15     ul-STTI-Length-r15 }</pre>	SEQUENCE { ShortTTI-Length-r15 ShortTTI-Length-r15	OPTIONAL, OPTIONAL	Need OR Need OR
ShortTTI-Length-r15 ::=	ENUMERATED $\{$ slot, subslot $\}$		
ASN1STOP			

	PhysicalConfigDedicated field descriptions
absenceOfAnyOtherTe	
	cates absence on a long term basis (e.g. by level of regulation) of any other technology nee of this field indicates the potential presence of any other technology sharing the carrier,
as specified in TS 36.213	
additionalSpectrumEm	issionPCell
E-UTRAN does not confi	gure this field in this release of the specification.
antennalnfo	
A choice is used to indica	ate whether the antennalnfo is signalled explicitly or set to the default antenna configuration
as specified in clause 9.2	.4.
blindSlotSubslotPDSCl	
Enables HARQ-less/blind	I slot or subslot PDSCH repetitions for a UE in a given cell, i.e. back to back slot/subslot
	r the same transport block. The number of slot/subslot PDSCH transmissions is indicated in
the DCI.	
blindSubframePDSCH-	
	subframe PDSCH repetitions for a UE in a given cell, i.e. back to back PDSCH
	ne transport block. The number of PDSCH transmissions is indicated in the DCI.
cqi-ShortConfigSCell	
	I (CQI/PMI/RI/PTI/CRI) reporting resource configured by <i>cqi-ShortConfigSCell</i> is available
	activation command for this SCell. E-UTRAN only configures this field when transmission
	or the serving cell on this carrier frequency.
ce-Mode	a analytical in TS 26 040 [00]
	s specified in TS 36.213 [23].
ce-pdsch-pusch-Enhan	
	rs of repetitions for PUSCH and modulation restrictions for PDSCH/PUSCH in CE mode A,
see TS 36.212 [22] and T	5 36.213 [23].
csi-RS-Config	LITRAN doop not configure on DC Config (includes zeroTyDewer(CCLDC) when
	E-UTRAN does not configure <i>csi-RS-Config</i> (includes <i>zeroTxPowerCSI-RS</i> ) when
csi-RS-ConfigNZPToAc	configured for the serving cell on this carrier frequency.
	E-UTRAN configures one or more CSI-RS-ConfigNZP only when transmission mode 9 or 10
	ing cell on this carrier frequency. For a serving frequency, EUTRAN configures a maximum
	gNZP in accordance with transmission mode (including CSI processes), eMIMO (including
	E capabilities (e.g. k-Max, n-MaxList).
csi-RS-ConfigZP-ApLis	
	for PDSCH rate matching. The field <i>subframeConfig</i> is applicable to semi-persistent CSI R
	the UE shall ignore field subframeConfig.
csi-RS-ConfigZPToAdd	
	E-UTRAN configures one or more CSI-RS-ConfigZP only when transmission mode 10 is
	g cell on this carrier frequency.
dl-STTI-Length, ul-STTI	-Length
	short TTI lengths. Value slot corresponds to 7 OFDM symbols and value subslot corresponds
to 2 or 3 OFDM symbols.	E-UTRAN configures the same value for all serving cells sending PUCCH feedback on the
	configured with short TTI in the group of cells configured to send PUCCH on the same cell,
	shall be configured with short TTI. E-UTRAN can configure different value of dl-STTI-Length
	erving cells sending PUCCH feedback on different cells. E-UTRAN does not configure the
combination {slot,subslot	} for {DL,UL}.
dummy	
	ne specification. If received it shall be ignored by the UE.
	eimta-MainConfigSCell
	imta-MainConfigPCell or eimta-MainConfigSCell for one serving cell in a frequency band, E-
	-MainConfigPCell or eimta-MainConfigSCell for all serving cells residing on the frequency
	es eimta-MainConfigPCell or eimta-MainConfigSCell only if eimta-MainConfig is configured.
energyDetectionThresh	
	default maximum energy detection threshold value. Unit in dB. Value -13 corresponds to -
	nds to -12dB, and so on (i.e. in steps of 1dB) as specified in TS 36.213 [23].
epdcch-Config	
	Config for the cell. E-UTRAN does not configure EPDCCH-Config for an SCell that is
	er for schedulingCellInfo in CrossCarrierSchedulingConfig.
k-max	
	umber of interfering spatial layers signaled in the assistance information for MUST. Value I1
	alue I3 corresponds to 3 layers.
	PUSCH-Mode2, laa-PUSCH-Mode3

Indicates whether LAA PUSCH mode 1, 2 and/or 3 is configured as specified in TS 36.212 [22], clause 5.3.3.1.

PhysicalConfigDedicated field descriptions
laa-SCellSubframeConfig
A bit-map indicating LAA SCell subframe configuration, "1" denotes that the corresponding subframe is allocated as MBSFN subframe. The bitmap is interpreted as follows:
Starting from the first/leftmost bit in the bitmap, the allocation applies to subframes #1, #2, #3, #4, #6, #7, #8, and #9.
maxEnergyDetectionThreshold
Indicates the absolute maximum energy detection threshold value. Unit in dBm. Value -85 corresponds to -85 dBm,
value -84 corresponds to -84 dBm, and so on (i.e. in steps of 1dBm) as specified in TS 36.213 [23]. If the field is not
configured, the UE shall use a default maximum energy detection threshold value as specified in TS 36.213 [23].
maxNumber-SlotSubslotPDSCH-Repetitions
Indicates the maximum number of PDSCH transmissions for slot or subslot PDSCH repetitions.
<i>maxNumber-SubframePDSCH-Repetitions</i> Indicates the maximum number of PDSCH transmissions for subframe PDSCH repetitions.
mondates the maximum number of Poster transmissions for submanie Poster repetitions.
Indicates the MCS restriction in terms of number of non-addressable MSB in the MCS bit-field for slot or subslot
PDSCH repetition applicable when $k > 1$ .
mcs-restrictionSubframePDSCH-Repetitions
Indicates MCS restriction in terms of number of non-addressable MSB in the MCS bit-field for subframe PDSCH
repetition applicable when k > 1.
numberOfProcesses-SlotSubslotPDSCH-Repetitions
Indicates the number of HARQ processes for slot/subslot PDSCH repetition applicable when k > 1 configured per
serving cell. numberOfProcesses-SubframePDSCH-Repetitions
Indicates the number of HARQ processes for subframe PDSCH repetition applicable when k > 1 configured per
serving cell.
p-a-must
Parameter: P _A , see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB
etc.
pdsch-ConfigDedicated-v1130
For a serving frequency, E-UTRAN configures pdsch-ConfigDedicated-v1130 only when transmission mode 10 is
configured for the serving cell on this carrier frequency.
pdsch-ConfigDedicated-v1280
For a serving frequency, E-UTRAN configures <i>pdsch-ConfigDedicated-v1280</i> only when transmission mode 9 or 10 is
configured for the serving cell on this carrier frequency.
<i>pucch-Cell</i> If present, PUCCH feedback of this SCell is sent on the PUCCH SCell. If absent, PUCCH feedback of this SCell is
sent on PCell or PSCell, or if the cell concerns the PUCCH SCell, on the concerned cell. If this field is not modified
upon change of PUCCH SCell, the UE shall always send the PUCCH feedback of the concerned SCell using the
configured PUCCH SCell.
pucch-ConfigDedicated
E-UTRAN configures <i>pucch-ConfigDedicated-r13</i> only if <i>pucch-ConfigDedicated</i> (i.e., without suffix) is not configured.
UE shall ignore pucch-ConfigDedicated-v1020 when pucch-ConfigDedicated-r13 is configured.
pucch-SCell
If present, the concerned SCell is the PUCCH SCell. E-UTRAN only configures this field upon SCell addition i.e. this field is only released when the SCell is released. The field is not applicable for an LAA SCell in this release.
pusch-ConfigDedicated-r13
E-UTRAN configures pusch-ConfigDedicated-r13 only if pusch-ConfigDedicated is not configured.
pusch-ConfigDedicated-v1250
E-UTRAN configures pusch-ConfigDedicated-v1250 only if tpc-SubframeSet is configured.
pusch-EnhancementsConfig
Indicates that the UE shall transmit in the PUSCH enhancement mode if <i>pusch-EnhancementsConfig</i> is set to <i>setup</i> ,
see TS 36.211 [21] and TS 36.213 [23].
rv-SlotsublotPDSCH-Repetitions
Indicates the RV cycling sequence for slot or subslot PDSCH repetition. Value dlrvseq1 = $\{0, 0, 0, 0\}$ and value dlrvseq2 = $\{0, 2, 3, 1\}$ .
rv-SubframePDSCH-Repetitions
Indicates the RV cycling sequence for subframe PDSCH repetition. Value dlrvseq1 = {0, 0, 0, 0} and value dlrvseq2 =
$\{0, 2, 3, 1\}$ .
semiOpenLoop, semiOpenLoopSTTI
Value TRUE indicates that semi-open-loop transmission is used for deriving CSI reporting and corresponding PDSCH
transmission (DMRS).
semiStaticCFI-SlotSubslotNonMBSFN
Indicates the semi-static control format indicator for slot/subslot operation in non-MBSFN subframes.
semiStaticCFI-SlotSubslotMBSFN
Indicates the semi-static control format indicator for slot/subslot operation in MBSFN subframes.
semiStaticCFI-SubframeMBSFN Indicates the semi-static control format indicator for subframe operation in MBSFN subframes.
manales me semi-static control romat indicator for subilante operation in MDSEN SUDITATIES.

PhysicalConfigDedicated field descriptions	
emiStaticCFI- SubframeNonMBSFN	
ndicates the semi-static control format indicator for subframe operation in non-MBSFN subframes.	
hortProcessingTime	
ndicates whether short processing time is configured as specific in TS 36.321 [6]. An SCell can on	ly be configured
ith short processing if the cell carrying PUCCH for that SCell is configured with short processing t	ime.
oundingRS-UL-PeriodicConfigDedicatedList	
ndicates periodic soundingRS configuration except for the extension sounding symbols of the UpP	Ts subframe. E-
ITRAN configures this field in <i>PhysicalConfigDedicated</i> only for the UE indicating support of ce-SI	
14 or ce-SRS-EnhancementWithoutComb4-r14. E-UTRAN configures this field in PhysicalConfigE	
nly for the UE indicating support of srs-UpPTS-6sym-r14.	
oundingRS-UL-PeriodicConfigDedicatedUpPTsExtList	
ndicates periodic sounding RS configuration in extension sounding symbols of the UpPTs subframe	e. E-UTRAN
onfigures this field in <i>PhysicalConfigDedicated</i> only for the UE indicating support of ce-SRS-Enha	
SRS-EnhancementWithoutComb4-r14. E-UTRAN configures this field in PhysicalConfigDedicated	
ne UE indicating support of srs-UpPTS-6sym-r14.	
oundingRS-UL-AperiodicConfigDedicatedList	
indicates aperiodic sounding RS configuration except for the extension sounding symbols of the Up	PTs subframe E-
ITRAN configures this field in <i>PhysicalConfigDedicated</i> only for the UE indicating support of <i>ce-SI</i>	
14 or ce-SRS-EnhancementWithoutComb4-r14. E-UTRAN configures this field in PhysicalConfigE	
nly for the UE indicating support of srs-UpPTS-6sym-r14.	
oundingRS-UL-DedicatedApUpPTsExtList	
ndicates aperiodic soundingRS configuration in extension sounding symbols of the UpPTs subfran	ng F-HTRAN
onfigures this field in <i>PhysicalConfigDedicated</i> only for the UE indicating support of ce-SRS-Enha	$n_{comont_r1A}$ or $c_{co-}$
SRS-EnhancementWithoutComb4-r14. E-UTRAN configures this field in PhysicalConfigDedicated	
The UE indicating support of srs-UpPTS-6sym-r14.	
rs-CC-SetIndexList	
ndicates the srs-CC-SetIndex list which the soundingRS-UL-ConfigDedicatedAperiodic and sound	linaRS-111 -
ConfigDedicatedAperiodicUpPTsExt belongs to.	IIIgi10=0L=
rs-DCI7-TriggeringConfig	
ndicates whether SRS triggering via DCI7 is configured.	
ubframeStartPosition	
indicates possible starting positions of transmission in the first subframe of the DL transmission but	rot 000 TS 26 211
21]. Value s0 means the starting position is subframe boundary, s07 means the starting position is	
oundary or slot boundary.	
pc-PDCCH-ConfigPUCCH	
DCCH configuration for power control of PUCCH using format 3/3A, see TS 36.212 [22].	
pc-PDCCH-ConfigPUSCH	
DCCH configuration for power control of PUSCH using format 3/3A, see TS 36.212 [22].	
ypeA-SRS-TPC-PDCCH-Group	<i>c</i> <u>a</u> <u>u</u> <u></u> <u>w</u>
ndicates Type A trigger configuration for SRS transmission on a PUSCH-less SCell. E-UTRAN con	ntigures the UE with
ither typeA-SRS-TPC-PDCCH-Group or typeB-SRS-TPC-PDCCH-Group, if any.	
plinkPowerControlDedicated	
-UTRAN configures uplinkPowerControlDedicated-v1130 only if uplinkPowerControlDedicated (w	ithout suffix) is
onfigured.	
plinkPowerControlDedicatedSCell	
-UTRAN configures uplinkPowerControlDedicatedSCell-v1130 only if uplinkPowerControlDedicat	edSCell-r10 is
onfigured for this serving cell.	

Conditional presence	Explanation
Al-r8	The field is optionally present, need ON, if <i>antennaInfoDedicated-r10</i> is absent. Otherwise the field is not present
Al-r10	The field is optionally present, need ON, if <i>antennaInfoDedicated</i> is absent. Otherwise the field is not present
AperiodicSRS	If <i>soundingRS-UL-ConfigDedicatedAperiodic-r10</i> is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field.
AperiodicSRSExt	If soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field.
AUL	The field is optionally present, need ON, if <i>aul-config-r15</i> is present. Otherwise the field is not present.
CommonUL	The field is mandatory present if <i>ul-Configuration</i> of <i>RadioResourceConfigCommonSCell-</i> <i>r10</i> is present; otherwise it is optional, need ON.
CQI-r8	The field is optionally present, need ON, if <i>cqi-ReportConfig-r10</i> is absent. Otherwise the field is not present
CQI-r10	The field is optionally present, need ON, if <i>cqi-ReportConfig</i> is absent. Otherwise the field is not present
Cross-Carrier-Config	The field is optionally present, need ON, if <i>crossCarrierSchedulingConfig-r10</i> is absent. Otherwise the field is not present
Cross-Carrier-ConfigUL	The field is optionally present, need ON, if <i>crossCarrierSchedulingConfig-r10</i> and <i>crossCarrierSchedulingConfig-r13</i> are absent or <i>schedulingCellInfo</i> is set to 'own'. Otherwise the field is not present.
PeriodicSRS	If soundingRS-UL-ConfigDedicated-r10 is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field.
PeriodicSRSPCell	If <i>soundingRS-UL-ConfigDedicated</i> is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field.
PeriodicSRSExt	If <i>soundingRS-UL-ConfigDedicatedUpPTsExt-r13</i> is absent, the field is optional, Need ON. Otherwise the field is not present and the UE shall delete any existing value for this field.
PUCCH-Format4or5	The field is mandatory present with <i>pucch-Format-v1370</i> set to <i>setup</i> if <i>pucch-ConfigDedicated-r13</i> is configured and <i>pucch-ConfigDedicated-r13</i> indicates PUCCH format 4 or PUCCH format 5; otherwise it is not present and the UE shall delete any existing value for this field.
PUCCH-SCell1	The field is optionally present, need OR, for SCell not configured with <i>pucch-configDedicated-r13</i> . Otherwise it is not present.
PUSCH-SCell	The field is optionally present, need ON, if <i>pusch-ConfigDedicatedSCell-r10 and pusch-ConfigDedicated-v1130</i> are absent. Otherwise the field is not present
PUSCH-SCell1	The field is optionally present, need ON, for SCell not configured with <i>pucch-configDedicated-r13</i> . Otherwise it is not present.
SCellAdd	The field is mandatory present if <i>cellIdentification</i> is present; otherwise it is optional, need ON.
SRS-Trigger-TypeA	The field is mandatory present if <i>typeA-SRS-TPC-PDCCH-Group-r14</i> is present. Otherwise the field is not present and the UE shall delete any existing value for this field.

- NOTE 1: During handover, the UE performs a MAC reset, which involves reverting to the default CQI/ SRS/ SR configuration in accordance with clause 5.3.13 and TS 36.321 [6], clauses 5.9 and 5.2. Hence, for these parts of the dedicated radio resource configuration, the default configuration (rather than the configuration used in the source PCell) is used as the basis for the delta signalling that is included in the message used to perform handover.
- NOTE 2: Since delta signalling is not supported for the common SCell configuration, E-UTRAN can only add or release the uplink of an SCell by releasing and adding the concerned SCell.

# P-Max

The IE *P-Max* is used to limit the UE's uplink transmission power on a carrier frequency and is used to calculate the parameter *Pcompensation* defined in TS 36.304 [4]. Corresponds to parameter  $P_{EMAX}$  or  $P_{EMAX,c}$  in TS 36.101 [42]. The UE transmit power on one serving cell shall not exceed the configured maximum UE output power of the serving cell determined by this value as specified in TS 36.101 [42], clauses 6.2.5 or 6.2.5A, or, when transmitting sidelink discovery announcements within the coverage of the concerned cell, as specified in TS 36.101 [42], clause 6.2.5D.

## P-Max information element

P-Max ::= INTEGER (-30..33)

-- ASN1STOP

-- ASN1START

# PRACH-Config

The IE *PRACH-ConfigSIB* and IE *PRACH-Config* are used to specify the PRACH configuration in the system information and in the mobility control information, respectively.

### **PRACH-Config** information elements

PRACH-ConfigSIB ::= SEQUENCE { INTEGER (0..837), rootSequenceIndex prach-ConfigInfo PRACH-ConfigInfo } PRACH-ConfigSIB-v1310 ::= SEQUENCE { rsrp-ThresholdsPrachInfoList-r13 RSRP-ThresholdsPrachInfoList-r13, mpdcch-startSF-CSS-RA-r13 CHOICE { ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8, fdd-r13 v10}, tdd-r13 ENUMERATED {v1, v2, v4, v5, v8, v10, v20, spare} OPTIONAL, -- Cond MP OPTIONAL, -- Need OR prach-HoppingOffset-r13 INTEGER (0..94) prach-HoppingOffset-r13 prach-ParametersListCE-r13 PRACH-ParametersListCE-r13 } PRACH-ConfigSIB-v1530 ::= CH-ConfigSIB-v1530 ::= SEQUENCE { edt-PRACH-ParametersListCE-r15 SEQUENCE (SIZE(1..maxCE-Level-r13)) OF EDT-PRACH-ParametersCE-r15 } rootSequenceIndex prach-ConfigInfo PRACH-Config ::= SEQUENCE { INTEGER (0..837), PRACH-ConfigInfo OPTIONAL -- Need ON } PRACH-Config-v1310 ::= SEQUENCE { rsrp-ThresholdsPrachInfoList-r13 RSRP-ThresholdsPrachInfoList-r13 OPTIONAL, --Cond MP mpdcch-startSF-CSS-RA-r13 CHOICE { fdd-r13 ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8, v10}, tdd-r13 ENUMERATED {v1, v2, v4, v5, v8, v10, v20, spare} OPTIONAL, -- Cond MP INTEGER (0..94) PRACH-ParametersListCE-r13 prach-HoppingOffset-r13 OPTIONAL, -- Need OR prach-HoppingOffset-r13 prach-ParametersListCE-r13 -- Cond MP OPTIONAL. initial-CE-level-r13 INTEGER (0..3) OPTIONAL -- Need OR } SEQUENCE { PRACH-Config-v1430 ::= rootSequenceIndexHighSpeed-r14 INTEGER (0..837), INTEGER (0..12), zeroCorrelationZoneConfigHighSpeed-r14 prach-ConfigIndexHighSpeed-r14 prach-FreqOffsetHighSpeed-r14 INTEGER (0..63), INTEGER (0..94) } PRACH-ConfigSCell-r10 ::= SEQUENCE { prach-ConfigIndex-r10 INTEGER (0..63) } PRACH-ConfigInfo ::= SEQUENCE { prach-ConfigIndex INTEGER (0..63), highSpeedFlag BOOLEAN. zeroCorrelationZoneConfig INTEGER (0..15), prach-FreqOffset INTEGER (0..94) } PRACH-ParametersListCE-r13 ::= SEQUENCE (SIZE(1..maxCE-Level-r13)) OF PRACH-ParametersCE-r13 PRACH-ParametersCE-r13 ::= SEOUENCE { INTEGER (0..63), prach-ConfigIndex-r13

```
prach-FreqOffset-r13
                                                      INTEGER (0..94),
                                      ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128,
   prach-StartingSubframe-r13
                                                               sf256}
                                                                                      OPTIONAL, -- Need OP
    maxNumPreambleAttemptCE-r13
                                   ENUMERATED {n3, n4, n5, n6, n7, n8, n10} OPTIONAL,
                                                                                                   -- Need OP
   numRepetitionPerPreambleAttempt-r13 \qquad ENUMERATED \ \{n1, n2, n4, n8, n16, n32, n64, n128\}, \\
                                                 SEQUENCE (SIZE(1..2)) OF
    mpdcch-NarrowbandsToMonitor-r13
                                                          INTEGER (1..maxAvailNarrowBands-r13),
                                                 ENUMERATED {r1, r2, r4, r8, r16,
    mpdcch-NumRepetition-RA-r13
                                                               r32, r64, r128, r256},
                                                 ENUMERATED {on,off}
    prach-HoppingConfig-r13
}
EDT-PRACH-ParametersCE-r15 ::= SEQUENCE {
edt-PRACH-ParametersCE-r15 SEQUENCE {
prach-ConfigIndex-r15 INTEGER (0..63),
prach ErogOffact r15 INTEGER (0.
                                                     INTEGER (0..94),
        prach-FreqOffset-r15
prach-FreqOIISet-FIS INTEGER (0...94),
prach-StartingSubframe-r15 ENUMERATED {sf2, sf4, sf8, sf16, sf32, sf64, sf128,
sf256} OPTIONAL, -- Need OP
        mpdcch-NarrowbandsToMonitor-r15 SEQUENCE (SIZE(1..2)) OF INTEGER
(1..maxAvailNarrowBands-r13)
  } OPTIONAL -- Need OR
}
RSRP-ThresholdsPrachInfoList-r13 ::= SEQUENCE (SIZE(1..3)) OF RSRP-Range
```

-- ASN1STOP

PRACH-Config field descriptions	
edt-PRACH-ParametersListCE	
Configures PRACH parameters for each CE level applicable to a UE performing EDT. If inc	
entries is same as number of entries in <i>prach-ParametersListCE</i> . The first entry in the list is	
for CE level 0, the second entry in the list is the PRACH parameters for CE level 1, and so	
maxNumPreambleAttemptCE, numRepetitionPerPreambleAttempt, mpdcch-NumRepetition	n-RA, prach-HoppingConfig
included in <i>prach-ParametersListCE</i> for CE level X are also applicable for EDT.	
initial-CE-level	
Indicates initial PRACH CE level at random access, see TS 36.321 [6]. If not configured, UI	E selects PRACH CE level
based on measured RSRP level, see TS 36.321 [6].	
highSpeedFlag	
Parameter: High-speed-flag, see TS 36.211 [21], clause 5.7.2]. TRUE corresponds to Rest	ricted set and FALSE to
Unrestricted set.	
maxNumPreambleAttemptCE	
Maximum number of preamble transmission attempts per CE level. See TS 36.321 [6].	
If the field is absent, the UE shall use the default value n3.	
mpdcch-NarrowbandsToMonitor	
Narrowbands to monitor for MPDCCH for RAR, see TS 36.213 [23], clause 6.2. Field value	
(1maxAvailNarrowBands-r13) correspond to narrowband indices (0[maxAvailNarrowBan	ds-r13-1]) as specified in
TS 36.211 [21].	
mpdcch-NumRepetition-RA	
Maximum number of repetitions for MPDCCH common search space (CSS) for RAR, Msg3	and Msg4, see TS 36.211
[21].	
mpdcch-startSF-CSS-RA	
Starting subframe configuration for MPDCCH common search space (CSS), including RAR	, Msg3 retransmission,
PDSCH with contention resolution and PDSCH with CCCH MAC SDU, see TS 36.211 [21]	and TS 36.213 [23]. Value
v1 corresponds to 1, value v1dot5 corresponds to 1.5, and so on.	
numRepetitionPerPreambleAttempt	
Number of PRACH repetitions per attempt for each CE level, See TS 36.211 [21].	
prach-ConfigIndex	
Parameter: prach-ConfigurationIndex, see TS 36.211 [21], clause 5.7.1.	
prach-ConfigIndexHighSpeed	
Parameter: prach-ConfigurationIndexHighSpeed, see TS 36.211 [21], clause 5.7.1. If this fi	eld is present, the UE shall
ignore prach-ConfigIndex.	
prach-FreqOffset	
Parameter: prach-FrequencyOffset, see TS 36.211 [21], clause 5.7.1. For TDD the value ra	inge is dependent on the
value of prach-ConfigIndex.	
prach-FreqOffsetHighSpeed	
Parameter: prach-FrequencyOffsetHighSpeed, see TS 36.211 [21], clause 5.7.1. For TDD t	the value range is
dependent on the value of prach-ConfigIndexHighSpeed. If this field is present, the UE sha	
prach-HoppingConfig	<u> </u>
Coverage level specific frequency hopping configuration for PRACH.	
prach-HoppingOffset	
Parameter: PRACH frequency hopping offset, expressed as a number of resource blocks, s	see TS 36.211 [21], clause
5.7.1.	L ]/
prach-ParametersListCE	
Configures PRACH parameters for each CE level. The first entry in the list is the PRACH parameters	arameters of CE level 0.
the second entry in the list is the PRACH parameters of CE level 1, and so on.	
prach-StartingSubframe	
PRACH starting subframe periodicity, expressed in number of subframes available for prea	mble transmission
(PRACH opportunities), see TS 36.211 [21]. Value sf2 corresponds to 2 subframes, sf4 cor	
and so on. EUTRAN configures the PRACH starting subframe periodicity larger than or equ	
PRACH repetitions per attempt for each CE level (numRepetitionPerPreambleAttempt).	
If the field is absent, the value is determined implicitly in TS 36.211 [21], clause 5.7.1.	
rootSequenceIndex	
Parameter: RACH_ROOT_SEQUENCE, see TS 36.211 [21], clause 5.7.1.	
rootSequenceIndexHighSpeed	s preambles based on

ignore zeroCorrelationZoneConfig.

Conditional presence	Explanation
MP	The field is mandatory present.

# PresenceAntennaPort1

The IE *PresenceAntennaPort1* is used to indicate whether all the neighbouring cells use Antenna Port 1. When set to *TRUE*, the UE may assume that at least two cell-specific antenna ports are used in all neighbouring cells.

# PresenceAntennaPort1 information element

-- ASN1START
PresenceAntennaPortl ::= BOOLEAN
-- ASN1STOP

# – PUCCH-Config

The IE *PUCCH-ConfigCommon* and IE *PUCCH-ConfigDedicated* are used to specify the common and the UE specific PUCCH configuration respectively.

# **PUCCH-Config** information elements

ASNISTART	
<pre>PUCCH-ConfigCommon ::=     deltaPUCCH-Shift     nRB-CQI     nCS-AN     n1PUCCH-AN }</pre>	<pre>SEQUENCE {     ENUMERATED {ds1, ds2, ds3},     INTEGER (098),     INTEGER (07),     INTEGER (02047)</pre>
<pre>PUCCH-ConfigCommon-v1310 ::= n1PUCCH-AN-InfoList-r13 pucch-NumRepetitionCE-Msg4-Lev pucch-NumRepetitionCE-Msg4-Lev pucch-NumRepetitionCE-Msg4-Lev pucch-NumRepetitionCE-Msg4-Lev }</pre>	vell-r13 ENUMERATED $\{n1, n2, n4, n8\}$ OPTIONAL, Need OR vel2-r13 ENUMERATED $\{n4, n8, n16, n32\}$ OPTIONAL, Need OR
<pre>PUCCH-ConfigCommon-v1430 ::=     pucch-NumRepetitionCE-Msg4-Lev }</pre>	SEQUENCE { vel3-r14 ENUMERATED {n64, n128} OPTIONAL Need OR
PUCCH-ConfigDedicated ::= ackNackRepetition release	SEQUENCE { CHOICE{ NULL.

```
setup
                                           SEQUENCE {
                                                ENUMERATED {n2, n4, n6, spare1},
            repetitionFactor
           n1PUCCH-AN-Rep
                                                INTEGER (0..2047)
    tdd-AckNackFeedbackMode
                                      ENUMERATED {bundling, multiplexing} OPTIONAL
                                                                                     -- Cond TDD
}
PUCCH-ConfigDedicated-v1020 ::= SEQUENCE {
   pucch-Format-r10
                                        CHOICE {
                                        PUCCH-Format3-Conf-r13,
       format3-r10
                                           SEQUENCE {
        channelSelection-r10
           n1PUCCH-AN-CS-r10
                                               CHOICE {
               release
                                                   NULL,
                setup
                                                    SEQUENCE {
                   nlPUCCH-AN-CS-List-r10
                                                       SEQUENCE (SIZE (1..2)) OF N1PUCCH-AN-CS-r10
                }
            }
                                                                            OPTIONAL
                                                                                        -- Need ON
        }
                                                                            OPTIONAL,
                                                                                        -- Need OR
                                                   ENUMERATED {true}
                                                                            OPTIONAL,
                                                                                       -- Need OR
    twoAntennaPortActivatedPUCCH-Formatlalb-r10
                                                                                       -- Need OR
    simultaneousPUCCH-PUSCH-r10
                                                   ENUMERATED {true}
                                                                            OPTIONAL,
    n1PUCCH-AN-RepP1-r10
                                                    INTEGER (0..2047)
                                                                           OPTIONAL
                                                                                       -- Need OR
}
PUCCH-ConfigDedicated-v1130 ::=
                                   SEOUENCE {
   n1PUCCH-AN-CS-v1130
                                        CHOICE {
                                           NULL,
       release
       setup
                                           SEOUENCE {
           n1PUCCH-AN-CS-ListP1-r11
                                               SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047)
        }
    }
                                                                            OPTIONAL, -- Need ON
    nPUCCH-Param-r11
                                        CHOICE {
       release
                                           NULL.
        setup
                                            SEQUENCE {
           nPUCCH-Identity-r11
                                               INTEGER (0..503),
           n1PUCCH-AN-r11
                                               INTEGER (0..2047)
        }
    }
                                                                            OPTTONAL
                                                                                        -- Need ON
}
PUCCH-ConfigDedicated-v1250 ::=
                                   SEOUENCE {
   nkaPUCCH-Param-r12
                                        CHOICE {
       release
                                           NULL,
       setup
                                            SEQUENCE {
           nkaPUCCH-AN-r12
                                               INTEGER (0..2047)
        }
    }
}
PUCCH-ConfigDedicated-r13 ::=
                                  SEOUENCE {
--Release 8
   ackNackRepetition-r13
                                        CHOICE {
       release
                                           NULL.
                                           SEQUENCE {
       setup
           repetitionFactor-r13
                                               ENUMERATED {n2, n4, n6, spare1},
            n1PUCCH-AN-Rep-r13
                                           INTEGER (0..2047)
        }
                                      ENUMERATED {bundling, multiplexing} OPTIONAL,
    tdd-AckNackFeedbackMode-r13
                                                                                      -- Cond TDD
--Release 10
   pucch-Format-r13
                                        CHOICE {
                                               SEQUENCE {
       format3-r13
           n3PUCCH-AN-List-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549) OPTIONAL,
                                                                                       -- Need ON
            twoAntennaPortActivatedPUCCH-Format3-r13
                                                           CHOICE {
               release
                                                                NULL.
                                                                SEQUENCE {
                setup
                   n3PUCCH-AN-ListP1-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)
                }
            }
                                                                            OPTIONAL
                                                                                       -- Need ON
        },
        channelSelection-r13
                                           SEQUENCE {
           n1PUCCH-AN-CS-r13
                                               CHOICE {
                release
                                                   NULT
                setup
                                                    SEQUENCE {
                                                       SEQUENCE (SIZE (1..2)) OF N1PUCCH-AN-CS-r10,
                   n1PUCCH-AN-CS-List-r13
                                  SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047)
                   dummv1
```

OPTIONAL -- Need ON } SEQUENCE { format4-r13 format4-resourceConfiguration-r13 SEQUENCE (SIZE (4)) OF Format4-resource-r13, format4-MultiCSI-resourceConfiguration-r13 SEQUENCE (SIZE (1..2)) OF Format4-resourcer13 OPTIONAL -- Need OR }, format5-r13 SEOUENCE { format5-resourceConfiguration-r13 SEQUENCE (SIZE (4)) OF Format5-resource-r13, format5-MultiCSI-resourceConfiguration-r13 Format5-resource-r13 OPTIONAL -- Need OR } OPTIONAL, -- Need OR OPTIONAL, -- Need OR } twoAntennaPortActivatedPUCCH-Formatlalb-r13 ENUMERATED {true} OPTIONAL, simultaneousPUCCH-PUSCH-r13 ENUMERATED {true} -- Need OR n1PUCCH-AN-RepP1-r13 INTEGER (0..2047) OPTIONAL, -- Need OR --Release 11 CHOICE { nPUCCH-Param-r13 release NULL, SEQUENCE { setup nPUCCH-Identity-r13 INTEGER (0..503), INTEGER (0..2047) n1PUCCH-AN-r13 } } OPTIONAL, -- Need ON --Release 12 nkaPUCCH-Param-r13 CHOICE { NULL, release SEQUENCE { setup nkaPUCCH-AN-r13 INTEGER (0..2047) } } -- Need ON OPTIONAL. --Release 13 spatialBundlingPUCCH-r13 BOOLEAN, spatialBundlingPUSCH-r13 BOOLEAN, harq-TimingTDD-r13 BOOLEAN, harq-TimingTDD-r13 harq-TimingTDD-r13Document,codebooksizeDetermination-r13ENUMERATED {dai,cc}maximumPayloadCoderate-r13INTEGER (0..7)pucch-NumRepetitionCE-r13CHOICE { OPTIONAL, -- Need OR OPTIONAL, -- Need OR NULL, release CHOICE { setup modeA SEQUENCE { pucch-NumRepetitionCE-format1-r13 ENUMERATED {r1, r2, r4, r8}, pucch-NumRepetitionCE-format2-r13 ENUMERATED  $\{r1, r2, r4, r8\}$ }, modeB SEQUENCE { pucch-NumRepetitionCE-format1-r13 ENUMERATED {r4, r8, r16, r32}, pucch-NumRepetitionCE-format2-r13 ENUMERATED {r4, r8, r16, r32} } } } OPTIONAL --Need ON } PUCCH-ConfigDedicated-v1370 ::= SEQUENCE { pucch-Format-v1370 CHOICE { release NULL, setup PUCCH-Format3-Conf-r13 } } PUCCH-ConfigDedicated-v13c0 ::= SEQUENCE { channelSelection-v13c0 SEQUENCE { n1PUCCH-AN-CS-v13c0 CHOICE CHOICE { release NULL, setup SEQUENCE { n1PUCCH-AN-CS-ListP1-v13c0 SEQUENCE (SIZE (2..4)) OF INTEGER (0..2047) } } } } PUCCH-Format3-Conf-r13 ::= SEQUENCE { n3PUCCH-AN-List-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549) OPTIONAL, -- Need ON twoAntennaPortActivatedPUCCH-Format3-r13 CHOICE { release NULL, SEOUENCE { setup n3PUCCH-AN-ListP1-r13 SEQUENCE (SIZE (1..4)) OF INTEGER (0..549) } OPTIONAL -- Need ON }

```
PUCCH-ConfigDedicated-v1430 ::= SEQUENCE {
   pucch-NumRepetitionCE-format1-r14 ENUMERATED {r64,r128} OPTIONAL -- Need OR
}
PUCCH-ConfigDedicated-v1530 ::= SEQUENCE {
    n1PUCCH-AN-SPT-r15 INTEGER (0..2047) OPTIONAL, -- Need OR
codebooksizeDeterminationSTTI-r15 ENUMERATED {dai,cc} OPTIONAL -- Need OR
   n1PUCCH-AN-SPT-r15
}
Format4-resource-r13 ::=
startingPRB-format4-r13
numberOfPRB-format4-r13
                                          SEQUENCE {
                                                     INTEGER (0..109),
                                             INTEGER (0...7)
}
Format5-resource-r13 ::=
startingPRB-format5-r13
cdm-index-format5-r13
                                          SEQUENCE {
                                           INTEGER (0..109),
                                                     INTEGER (0..1)
}
N1PUCCH-AN-CS-r10 := SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)
N1PUCCH-AN-InfoList-r13 ::= SEQUENCE (SIZE(1..maxCE-Level-r13)) OF INTEGER (0..2047)
-- ASN1STOP
```

PUCCH-Config field descriptions	
ackNackRepetition Parameter indicates whether ACK/NACK repetition is configured, see TS 36.213 [23], clause 10.1.	
cdm-index-format5	
Parameter $n_{oc}$ see TS 36.211 [21], clause 5.4.2c, for determining PUCCH resource(s) of PUCCH format 5.	
codebooksizeDetermination, codebooksizeDeterminationSTTI	
Parameter indicates whether HARQ codebook size is determined with downlink assignment indicator based solut or number of configured CCs, see TS 36.212 [22], clauses 5.2.2.6, 5.2.3.1 and 5.3.3.1.2, and TS 36.213 [23], cla 10.1.2.2.3, 10.1.3.2.3, 10.1.3.2.3.1, 10.1.3.2.3.2 and 10.1.3.2.4. deltaPUCCH-Shift	luses
Parameter: $\Delta_{\text{shift}}^{\text{PUCCH}}$ , see TS 36.211 [21], clause 5.4.1, where ds1 corresponds to value 1, ds2 corresponds to value to value 1, ds2 corresponds to value to va	lue 2
dummy1 This field is not used in the specification. If received it shall be ignored by the UE.	
h <b>arq-TimingTDD</b> Parameter indicates for a TDD SCell when aggregated with a TDD PCell of different UL/DL configurations whethe deriving the HARQ timing for such a cell is done in the same way as the DL HARQ timing of an FDD SCell with a	
PCell, see TS 36.213 [23], clause 10.2.	
maximumPayloadCoderate Maximum payload or code rate for multi P-CSI on each PUCCH resource, see TS 36.213 [23], clause 10.1.1. m1PUCCH-AN	
Parameter: $N_{PUCCH}^{(1)}$ , see TS 36.213 [23], clause 10.1.	
n1PUCCH-AN-r11 indicates UE-specific PUCCH AN resource offset, see TS 36.213 [23], clause 10.1. n1PUCCH-AN-CS-List	
Parameter: $n_{\text{PUCCH}, j}^{(1)}$ for antenna port $p_0$ for PUCCH format 1b with channel selection, see TS 36.213 [23], clau	Jses
10.1.2.2.1 and 10.1.3.2.1.	
n1PUCCH-AN-CS-ListP1 Parameter: $n_{PUCCH, i}^{(1, \tilde{p}_1)}$ for antenna port $p_1$ for PUCCH format 1b with channel selection, see TS 36.213 [23], claus	se
10.1. E-UTRAN configures this field only when pucch-Format is set to channelSelection.	
n1PUCCH-AN-Rep, n1PUCCH-AN-RepP1	
Parameter: $n_{PUCCH, ANRep}^{(1, p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause	10.1
n3PUCCH-AN-List, n3PUCCH-AN-ListP1	
Parameter: $n_{PUCCH}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1.	
Parameter: $N_{PUCCH}^{(1)}$ , see TS 36.213 [23], clause 10.1. Indicates UE-specific PUCCH AN resource offset for shore	rt
processing time. nCS-An	
Parameter: $N_{cs}^{(1)}$ see TS 36.211 [21], clause 5.4.	
nkaPUCCH-AN	
Parameter: $N_{ m PUCCH}^{ m K_A}$ , see TS 36.213 [23], clause 10.1.3.	
nkaPUCCH-AN-r12 indicates PUCCH format 1a/1b starting offset for the subframe set $K^A$ , see TS 36.213 [23], clause 10.1.3. E-UTRAN configures <i>nkaPUCCH-AN</i> only if <i>eimta-MainConfig</i> is configured.	
n <b>PUCCH-Identity</b> Parameter: $n_{\rm ID}^{\rm PUCCH}$ , see TS 36.211 [21], clause 5.5.1.5.	
nRB-CQI	
Parameter: $N_{RB}^{(2)}$ , see TS 36.211 [21], clause 5.4.	
numberOfPRB-format4	
Parameter $n_{PUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2, for determining PUCCH resource(s) of PUCCH format 4.	
n1PUCCH-AN-InfoList Starting offsets of the PUCCH resource(s) indicated by SIB1-BR. The first entry in the list is the starting offset of the PUCCH resource(s) of CE level 0, the second entry in the list is the starting offset of the PUCCH resource(s) of C evel 1, and so on. If E-UTRAN includes n1PUCCH-AN-InfoList, it includes the same number of entries as in prace ParametersListCE. See TS 36.213 [23].	the CE

ParametersListCE. See TS 36.213 [23].

#### **PUCCH-Config** field descriptions

## pucch-Format Parameter indicates one of the PUCCH formats for transmission of HARQ-ACK, see TS 36.213 [23], clause 10.1. For TDD, if the UE is configured with PCell only, the channelSelection indicates the transmission of HARQ-ACK multiplexing as defined in Tables 10.1.3-5, 10.1.3-6, and 10.1.3-7 in TS 36.213 [23] for PUCCH, and in 7.3 in TS 36.213 [23] for PUSCH. E-UTRAN only configures pucch-Format-v1370 when pucch-Format-r13 is configured and set to format4 or format5. pucch-NumRepetitionCE Number of PUCCH repetitions for PUCCH format 1/1a and for PUCCH format 2/2a/2b for CE modes A and B. see TS 36.211 [21] and TS 36.213 [23]. The UE shall ignore pucch-NumRepetitionCE-format2-r13, if received, for CE mode B in this release of specification. For UE in CE mode B supporting extended PUCCH repetition, if pucch-NumRepetitionCE-format1-r14 is included then the UE shall ignore pucch-NumRepetitionCE-format1-r13. pucch-NumRepetitionCE-Msg4-Level0, pucch-NumRepetitionCE-Msg4-Level1, pucch-NumRepetitionCE-Msg4-Level2, pucch-NumRepetitionCE-Msg4-Level3 Number of repetitions for PUCCH carrying HARQ response to PDSCH containing Msg4 for PRACH CE levels 0, 1, 2 and 3, see TS 36.211 [21] and TS 36.213 [23]. Value n1 corresponds to 1 repetition, value n2 corresponds to 2 repetitions, and so on. For BL UEs or non-BL UEs in enhanced coverage supporting extended PUCCH repetition, if pucch-NumRepetitionCE-Msg4-Level3-r14 is included then the UE shall ignore pucch-NumRepetitionCE-Msg4-Level3-r13. repetitionFactor Parameter $N_{\rm ANRen}$ see TS 36.213 [23], clause 10.1, where n2 corresponds to repetition factor 2, n4 to 4. simultaneousPUCCH-PUSCH Parameter indicates whether simultaneous PUCCH and PUSCH or simultaneous SPUCCH and SlotOrSubslotPUSCH transmissions are configured, see TS 36.213 [23], clauses 10.1 and 5.1.1. E-UTRAN configures this field for the PCell, only when the nonContiguousUL-RA-WithinCC-Info is set to supported in the band on which PCell is configured. Likewise, E-UTRAN configures this field for the PSCell, only when the nonContiguousUL-RA-WithinCC-Info is set to supported in the band on which PSCell is configured. Likewise, E-UTRAN configures this field for the PUCCH SCell, only when the nonContiguousUL-RA-WithinCC-Info is set to supported in the band on which PUCCH SCell is configured. spatialBundlingPUCCH Parameter indicates whether spatial bundling is enabled or not for PUCCH, see TS 36.212 [22], clause 5.2.3.1. spatialBundlingPUSCH Parameter indicates whether spatial bundling is enabled or not for PUSCH, see see TS 36.212 [22], clause 5.2.2.6. startingPRB-format4 Parameter $n_{PUCCH}^{(4)}$ see TS 36.211 [21], clause5.4.3 for determining PUCCH resource(s) of PUCCH format 4. startingPRB-format5 Parameter $n_{\text{PUCCH}}^{(5)}$ see TS 36.211 [21], clause 5.4.3 for determining PUCCH resource(s) of PUCCH format 5. tdd-AckNackFeedbackMode Parameter indicates one of the TDD ACK/NACK feedback modes used, see TS 36.213 [23], clauses 7.3 and 10.1.3. The value bundling corresponds to use of ACK/NACK bundling whereas, the value multiplexing corresponds to ACK/NACK multiplexing as defined in Tables 10.1.3-2, 10.1.3-3, and 10.1.3-4 in TS 36.213 [23]. The same value applies to both ACK/NACK feedback modes on PUCCH as well as on PUSCH. twoAntennaPortActivatedPUCCH-Format1a1b Indicates whether two antenna ports are configured for PUCCH format 1a/1b for HARQ-ACK, see TS 36.213 [23], clause 10.1. The field also applies for PUCCH format 1a/1b transmission when format3 is configured, see TS 36.213 [23], clauses 10.1.2.2.2 and 10.1.3.2.2.

twoAntennaPortActivatedPUCCH-Format3

Indicates whether two antenna ports are configured for PUCCH format 3 for HARQ-ACK, see TS 36.213 [23], clause 10.1.

Conditional presence	Explanation	
TDD	The field is mandatory present for TDD if the <i>pucch-Format</i> is not present. If the <i>pucch</i> -	
	Format is present, the field is not present and the UE shall delete any existing value for	
	this field. It is not present for FDD and the UE shall delete any existing value for this field.	

# PUSCH-Config

The IE PUSCH-ConfigCommon is used to specify the common PUSCH configuration and the reference signal configuration for PUSCH and PUCCH. The IE PUSCH-ConfigDedicated is used to specify the UE specific PUSCH configuration.

-- ASN1START

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# PUSCH-Config information element

PUSCH-ConfigCommon ::= SEQUENCE { pusch-ConfigBasic SEQUENCE { INTEGER (1..4), n-SB ENUMERATED {interSubFrame, intraAndInterSubFrame}, hoppingMode pusch-HoppingOffset INTEGER (0..98), enable64QAM BOOLEAN ul-ReferenceSignalsPUSCH UL-ReferenceSignalsPUSCH } PUSCH-ConfigCommon-v1270 ::= SEQUENCE { enable64QAM-v1270 ENUMERATED {true} } PUSCH-ConfigCommon-v1310 ::= SEQUENCE { pusch-maxNumRepetitionCEmodeA-r13 ENUMERATED { r8, r16, r32 } OPTIONAL, -- Need OR pusch-maxNumRepetitionCEmodeB-r13 ENUMERATED { r192, r256, r384, r512, r768, r1024, r1536, r2048} OPTIONAL, -- Need OR pusch-HoppingOffset-v1310 INTEGER (1..maxAvailNarrowBands-r13) OPTTONAL -- Need OR } PUSCH-ConfigDedicated ::= SEQUENCE { INTEGER (0..15), betaOffset-ACK-Index INTEGER (0..15), betaOffset-RI-Index betaOffset-CQI-Index INTEGER (0..15) } PUSCH-ConfigDedicated-v1020 ::= SEQUENCE { betaOffsetMC-r10 SEQUENCE { betaOffset-ACK-Index-MC-r10 INTEGER (0..15), betaOffset-RI-Index-MC-r10 INTEGER (0..15), INTEGER (0..15) betaOffset-CQI-Index-MC-r10 OPTIONAL, -- Need OR OPTIONAL, groupHoppingDisabled-r10 ENUMERATED {true} -- Need OR dmrs-WithOCC-Activated-r10 ENUMERATED {true} OPTIONAL -- Need OR } PUSCH-ConfigDedicated-v1130 ::= SEQUENCE { pusch-DMRS-r11 CHOICE { NULL, release SEQUENCE { setup nPUSCH-Identity-r11 INTEGER (0..509), nDMRS-CSH-Identity-r11 INTEGER (0..509) } } } SEQUENCE { PUSCH-ConfigDedicated-v1250::= uciOnPUSCH CHOICE { release NULL, SEQUENCE { setup betaOffset-ACK-Index-SubframeSet2-r12 INTEGER (0..15), betaOffset-RI-Index-SubframeSet2-r12 INTEGER (0..15), INTEGER (0..15), betaOffset-CQI-Index-SubframeSet2-r12 SEQUENCE { betaOffsetMC-r12 betaOffset-ACK-Index-MC-SubframeSet2-r12 INTEGER (0..15), betaOffset-RI-Index-MC-SubframeSet2-r12 INTEGER (0..15), betaOffset-CQI-Index-MC-SubframeSet2-r12 INTEGER (0..15) } OPTIONAL -- Need OR } } SEQUENCE { PUSCH-ConfigDedicated-r13 ::= INTEGER (0..15), betaOffset-ACK-Index-r13 betaOffset2-ACK-Index-r13 INTEGER (0..15) OPTIONAL, -- Need OR betaOffset-RI-Index-r13 INTEGER (0..15), betaOffset-CQI-Index-r13 INTEGER (0..15), betaOffsetMC-r13 SEQUENCE { betaOffset-ACK-Index-MC-r13 INTEGER (0..15), betaOffset2-ACK-Index-MC-r13 INTEGER (0..15) OPTIONAL, -- Need OR betaOffset-RI-Index-MC-r13 INTEGER (0..15),

betaOffset-CQI-Index-MC-r13 INTEGER (0..15) OPTIONAL, -- Need OR groupHoppingDisabled-r13 ENUMERATED {true} OPTIONAL, -- Need OR ENUMERATED {true} dmrs-WithOCC-Activated-r13 OPTIONAL, -- Need OR pusch-DMRS-r11 CHOICE { release NULL. SEOUENCE { setup INTEGER (0..509), nPUSCH-Identity-r13 nDMRS-CSH-Identity-r13 INTEGER (0..509) } } OPTIONAL, -- Need ON uciOnPUSCH CHOICE { NULL, release SEQUENCE { setup betaOffset-ACK-Index-SubframeSet2-r13 INTEGER (0..15), INTEGER (0..15) OPTIONAL, INTEGER (0..15), betaOffset2-ACK-Index-SubframeSet2-r13 -- Need OR INTEGER (0..15), INTEGER (0..15), betaOffset-RI-Index-SubframeSet2-r13 betaOffset-CQI-Index-SubframeSet2-r13 SEQUENCE { betaOffsetMC-r12 betaOffset-ACK-Index-MC-SubframeSet2-r13 INTEGER (0..15), betaOffset2-ACK-Index-MC-SubframeSet2-r13 INTEGER (0..15) OPTIONAL, -- Need OR betaOffset-RI-Index-MC-SubframeSet2-r13 INTEGER (0..15), betaOffset-CQI-Index-MC-SubframeSet2-r13 INTEGER (0..15) INTEGER (0..15) } OPTIONAL -- Need OR } } OPTIONAL, -- Need ON pusch-HoppingConfig-r13 ENUMERATED {on} OPTIONAL -- Need OR } PUSCH-ConfigDedicated-v1430 ::= SEOUENCE { ce-PUSCH-NB-MaxTBS-r14 ENUMERATED {on} OPTIONAL, -- Need OR ce-PUSCH-MaxBandwidth-r14 ENUMERATED {bw5} -- Need OR OPTIONAL, tdd-PUSCH-UpPTS-r14 TDD-PUSCH-UpPTS-r14 OPTIONAL, -- Need ON ul-DMRS-IFDMA-r14 BOOLEAN. enable256QAM-r14 Enable2560AM-r14 OPTIONAL -- Need ON } PUSCH-ConfigDedicated-v1530 ::= SEQUENCE { ce-PUSCH-FlexibleStartPRB-AllocConfig-r15 CHOICE { release NULL, setup SEQUENCE { offsetCE-ModeB-r15 INTEGER (-1..3) OPTIONAL -- Cond CE-ModeB } ce-PUSCH-SubPRB-Config-r15 CHOICE { release NULL, SEQUENCE { setup INTEGER (0..5) locationCE-ModeB-r15 INTEGER (0.. sixToneCyclicShift-r15 INTEGER (0..3), OPTIONAL, -- Cond CE-ModeB threeToneCyclicShift-r15 INTEGER (0..2) } } OPTIONAL -- Need ON } PUSCH-ConfigDedicatedSCell-r10 ::= SEQUENCE { groupHoppingDisabled-r10 ENUMERATED {true} OPTIONAL, -- Need OR dmrs-WithOCC-Activated-r10 ENUMERATED {true} OPTIONAL -- Need OR } PUSCH-ConfigDedicatedSCell-v1430 ::= SEQUENCE { enable256QAM-r14 Enable256QAM-r14 OPTIONAL -- Need OR } PUSCH-ConfigDedicatedScell-v1530 ::= SEQUENCE { uci-OnPUSCH-r15 CHOICE { release NULL SEQUENCE { setup betaOffsetAUL-r15 INTEGER (0..15) } } } TDD-PUSCH-UpPTS-r14 ::= CHOICE { release NULT setup SEOUENCE { symPUSCH-UpPTS-r14 ENUMERATED {sym1, sym2, sym3, sym4, sym5, sym6} OPTIONAL, -- Need ON dmrs-LessUpPTS-Config-r14 ENUMERATED {true} OPTIONAL -- Need OR

```
}
```

```
}
                                                    CHOICE {
Enable256QAM-r14 ::=
          release
                                                     NULL,
                                                         CHOICE {
          setup
                tpc-SubframeSet-Configured-r14
                                                              SEQUENCE {
                                                                                                                   BOOLEAN,
                         subframeSet1-DCI-Format0-r14
                          subframeSet1-DCI-Format4-r14
                                                                                                                   BOOLEAN,
                          subframeSet2-DCI-Format0-r14
                                                                                                                   BOOLEAN,
                          subframeSet2-DCI-Format4-r14
                                                                                                                    BOOLEAN
                },
                tpc-SubframeSet-NotConfigured-r14 SEQUENCE {
                        dci-Format0-r14 BOOLEAN,
dci-Format4-r14 BOOLEAN
                }
          }
}
PUSCH-EnhancementsConfig-r14 ::=
                                                   CHOICE {
                                             NULL,
    release
                                               SEQUENCE {
     setup
          pusch-HoppingOffsetPUSCH-Enh-r14 INTEGER (1..100) OPTIONAL, --

interval-ULHoppingPUSCH-Enh-r14 CHOICE {

interval-FDD-PUSCH-Enh-r14 ENUMERATED {int1, int2, int4, int8},

interval-TDD-PUSCH-Enh-r14 ENUMERATED {int1, int5, int10, int20}
                                                                INTEGER (1..100) OPTIONAL, -- Need ON
          }
                                                                                                   OPTIONAL
                                                                                                                   -- Need ON
     }
}
UL-ReferenceSignalsPUSCH ::= SEQUENCE {
groupHoppingEnabled BOOLEAI
groupAssignmentPUSCH INTEGEI
sequenceHoppingEnabled BOOLEAI
                                               BOOLEAN,
                                                    INTEGER (0..29),
    sequenceHoppingEnabled
                                                   BOOLEAN,
    cyclicShift
                                                   INTEGER (0..7)
}
-- ASN1STOP
```

hata Official t	PUSCH-Config field descriptions
betaOffset-A	CK-Index, betaOffset2-ACK-Index, betaOffset-ACK-Index-MC, betaOffset2-ACK-Index-MC
Parameter: I	$HARQ-ACK$ , $I_{offset,X}^{HARQ-ACK}$ , $I_{offset,MC}^{HARQ-ACK}$ and $I_{offset,MC,X}^{HARQ-ACK}$ , for single- and multiple-codeword respectively,
see TS 36.21 and betaOffse Index is config betaOffset2-A up to 22 HAR serving cells v cell in case Pl also applies fo	3 [23], Table 8.6.3-1. <i>betaOffset-ACK-Index</i> and <i>betaOffset2-ACK-Index</i> are used for single-codeword <i>et-ACK-Index-MC</i> and <i>betaOffset2-ACK-Index-MC</i> are used for multiple-codeword. If <i>betaOffset2-ACK-</i> gured; <i>betaOffset-ACK-Index</i> is used when up to 22 HARQ-ACK bits are transmitted otherwise <i>ACK-Index</i> is used. If <i>betaOffset-ACK2-Index-MC</i> is configured; <i>betaOffset-ACK-Index-MC</i> is used when a configured; <i>betaOffset-ACK2-Index-MC</i> is configured; <i>betaOffset-ACK-Index-MC</i> is used when a configured otherwise <i>betaOffset2-ACK-Index-MC</i> is used. One value applies for all with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the sam UCCH SCell is configured) and not configured with uplink power control subframe sets. The same value or subframe set 1 of all serving cells with an uplink in that cell group and configured with uplink power time sets (the associated functionality is common i.e. not performed independently for each cell).
	CK-Index-SubframeSet2, betaOffset2-ACK-Index-SubframeSet2, betaOffset-ACK-Index-MC-
	t2, betaOffset2-ACK-Index-MC-SubframeSet2
Parameter: I	$HARQ-ACK$ , $I_{offset,set2}^{HARQ-ACK}$ , $I_{offset,MC,set2}^{HARQ-ACK}$ and $I_{offset,MC,set2,X}^{HARQ-ACK}$ respectively, see TS 36.213 [23], Table 8.6.3-7
betaOffset-AC If betaOffset2 HARQ-ACK b MC-Subframe transmitted ot serving cells v cell in case Pl	CK-Index-SubframeSet2 and betaOffset2-ACK-Index-SubframeSet2 are used for single-codeword, CK-Index-MC-SubframeSet2, betaOffset2-ACK-Index-MC-SubframeSet2 are used for multiple-codeword CR-ACK-Index-SubframeSet2 is configured; betaOffset-ACK-Index-SubframeSet2 is used when up to 22 Dits are transmitted otherwise betaOffset2-ACK-Index-SubframeSet2 is used. If betaOffset2-ACK-Index- Set2 is configured; betaOffset-ACK-Index-MC-SubframeSet2 is used when up to 22 HARQ-ACK bits and therwise betaOffset2-ACK-Index-MC-SubframeSet2 is used when up to 22 HARQ-ACK bits and therwise betaOffset2-ACK-Index-MC-SubframeSet2 is used. One value applies for subframe set 2 of all with an uplink in a cell group (MCG or SCG or the group of cells configured to send PUCCH on the sam UCCH SCell is configured) and configured with uplink power control subframe sets (the associated is common i.e. not performed independently for each cell configured with uplink power control subframe
betaOffsetAl	UL
Parameter:	offset see TS 36.213 [23], clause 8.6.3.
	QI-Index, betaOffset-CQI-Index-MC
Parameter: $I_{j}$	^{CQI} , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-3. One value
PUCCH on th sets. The sam configured wit	serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send be same cell in case PUCCH SCell is configured) and not configured with uplink power control subframe ne value also applies for subframe set 1 of all serving cells with an uplink in that cell group and th uplink power control subframe sets (the associated functionality is common i.e. not performed y for each cell).
	QI-Index-SubframeSet2, betaOffset-CQI-Index-MC-SubframeSet2
Parameter: I	$\frac{CQI}{offset}$ , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-3. One value
applies for sul configured to control subfra configured wit	bframe set 2 of all serving cells with an uplink in a cell group (MCG or SCG or the group of cells send PUCCH on the same cell in case PUCCH SCell is configured) and configured with uplink power ame sets (the associated functionality is common i.e. not performed independently for each cell th uplink power control subframe sets).
	RI-Index, betaOffset-RI-Index-MC RI for single, and multiple codeword respectively, and TS 26 242 [22]. Table 8.6.2.2. One value
	<i>RI</i> offset, for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-2. One value
PUCCH on th sets. The sam configured wit independently	serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured to send be same cell in case PUCCH SCell is configured) and not configured with uplink power control subframe ne value also applies for subframe set 1 of all serving cells with an uplink in that cell group and th uplink power control subframe sets (the associated functionality is common i.e. not performed y for each cell). RI-Index-SubframeSet2, betaOffset-RI-Index-MC-SubframeSet2
	^{RI} _{offset} , for single- and multiple-codeword respectively, see TS 36.213 [23], Table 8.6.3-2. One value
configured to control subfra configured wit	bframe set 2 of all serving cells with an uplink in a cell group (MCG or SCG or the group of cells send PUCCH on the same cell in case PUCCH SCell is configured) and configured with uplink power ime sets (the associated functionality is common i.e. not performed independently for each cell th uplink power control subframe sets).
Activation of f starting PRB	<i>dexibleStartPRB-AllocConfig</i> dexible starting PRB for PUSCH resource allocation in CE mode A or B. <i>offsetCE-ModeB</i> indicates offset when flexible starting PRB for PUSCH resource allocation in CE mode B is enabled. See TS nd TS 36.213 [23]. E-UTRAN does not configure this field when E-UTRA system bandwidth is 1.4 MHz.

PUSCH-Config field descriptions
ce-PUSCH-MaxBandwidth
Maximum PUSCH channel bandwidth in CE mode A, see TS 36.212 [22] and TS 36.213 [23]. Value bw5 corresponds to 5 MHz. If this field is not configured, the maximum PUSCH channel bandwidth in CE mode A set to 1.4 MHz. The maximum PUSCH channel bandwidth in CE mode B is 1.4 MHz regardless of the setting of this parameter.
Parameter: transmission bandwidth configuration, see TS 36.101 [42], table 5.6-1.
ce-PUSCH-NB-MaxTBS
Activation of 2984 bits maximum PUSCH TBS in 1.4 MHz in CE mode A, see TS 36.212 [22] and TS 36.213 [23].
ce-PUSCH-SubPRB-Config
Activation of PUSCH sub-PRB allocation in CE mode A or B, see TS 36.211 [21], TS 36.212 [22] and TS 36.213 [23]. cyclicShift
Parameters: cyclicShift, see TS 36.211 [21], Table 5.5.2.1.1-2.
dmrs-LessUpPTS-Config
Indicates the UE not to transmit DMRS for PUSCH in UpPTS, see TS36.211 [21], clause 5.5.2.1.2.
<i>dmrs-WithOCC-Activated</i> Parameter: <i>Activate-DMRS-with OCC</i> , see TS 36.211 [21], clause 5.5.2.1.
enable256QAM
See TS 36.213 [23], clause 8.6.1. If <i>enable256QAM</i> is included and if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> , the field indicates (if set to TRUE) per uplink power control subframe set and DCI format 0/0A/0B and 4/4A/4B that 256QAM is allowed for UE UL categories 16 to 20 indicated in <i>ue-CategoryUL-v1430</i> , while FALSE indicates that 256 QAM is not allowed. If <i>enable256QAM</i> is included and if uplink power control subframe sets are not configured by <i>tpc-SubframeSet</i> , the field indicates (if set to TRUE) per DCI format 0/0A/0B and 4/4A/4B that 256QAM is allowed for UE UL categories 16 to 20 indicated in <i>ue-CategoryUL-v1430</i> , while FALSE indicates that 256 QAM is not allowed. If <i>enable256QAM</i> is not 256 QAM is allowed for UE UL categories 16 to 20 indicated in <i>ue-CategoryUL-v1430</i> , while FALSE indicates that 256 QAM is allowed.
enable64QAM
See TS 36.213 [23], clause 8.6.1. If <i>enable64QAM</i> (without suffix) is set to TRUE, it indicates that 64QAM is allowed for UE categories 5 and 8 indicated in <i>ue-Category</i> and UL categories indicated in <i>ue-CategoryUL</i> which support UL 64QAM and can fallback to category 5 or 8, see TS 36.306 [5], Table 4.1A-2 and Table 4.1A-6, while FALSE indicates that 64QAM is not allowed. If <i>enable64QAM-v1270</i> is set to TRUE, it indicates that 64QAM is allowed for UL categories indicated in <i>ue-CategoryUL</i> which support UL 64QAM but cannot fallback category 5 or 8, see TS 36.306 [5], Table 4.1A-2 and Table 4.1A-6. E-UTRAN configures <i>enable64QAM-v1270</i> only when <i>enable64QAM</i> (without suffix) is set to TRUE.
interval-ULHoppingPUSCH-Enh
Number of consecutive absolute subframes over which PUSCH stays at the same PRBs before hopping to other PRBs. For <i>interval-FDD-PUSCH-Enh</i> , int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For <i>interval-TDD-PUSCH-Enh</i> , int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on. See TS 36.211 [21], clause 5.3.4.
groupAssignmentPUSCH
Parameter: ⊿SS See TS 36.211 [21], clause 5.5.1.3.
<i>groupHoppingDisabled</i> Parameter: <i>Disable-sequence-group-hopping</i> , see TS 36.211 [21], clause 5.5.1.3.
groupHoppingEnabled
Parameter: Group-hopping-enabled, see TS 36.211 [21], clause 5.5.1.3.
<i>hoppingMode</i> Parameter: <i>Hopping-mode</i> , see TS 36.211 [21], clause 5.3.4.
locationCE-ModeB
PRB location within the narrowband when PUSCH sub-PRB allocation is enabled in CE mode B.
nDMRS-CSH-Identity
Parameter: $N_{\rm ID}^{\rm csh_DMRS}$ , see TS 36.211 [21], clause 5.5.2.1.1.
nPUSCH-Identity
Parameter: $n_{\text{ID}}^{\text{PUSCH}}$ , see TS 36.211 [21], clause 5.5.1.5.
n-SB
Parameter: Nsb see TS 36.211 [21], clause 5.3.4.
pusch-HoppingConfig For BL UEs and UEs in CE, frequency hopping activation/deactivation for unicast PUSCH, see TS 36.211 [21]
<i>pusch-hoppingOffset</i> Except for BL UEs and UEs in CE, parameter: $N_{\text{RB}}^{\text{HO}}$ , see TS 36.211 [21], clause 5.3.4. For BL UEs and UEs in CE,
the <i>pusch-hoppingOffset-v1310</i> indicates the parameter $f_{NB,hop}^{PUSCH}$ , see TS 36.211 [21], clause 5.3.4. In case <i>pusch-</i>
hoppingOffset-v1310 is signalled, the BL UEs and UEs in CE shall ignore pusch-hoppingOffset (i.e. without suffix). pusch-HoppingOffsetPUSCH-Enh
Indicates the frequency domain hopping offset between PRBs for PUSCH in frequency hopping, see TS 36.211 [21], clause 5.3.4. Value 1 corresponds to 1 PRB, value 2 corresponds to 2 PRBs, and so on.

# PUSCH-Config field descriptions

#### pusch-maxNumRepetitionCEmodeA

Maximum value to indicate the set of PUSCH repetition numbers for CE mode A, see TS 36.211 [21] and TS 36.213 [23]. E-UTRAN does not configure value r8. If the field is not configured, the UE shall apply the default value as defined in TS 36.213 [23], clause 8.0.

## pusch-maxNumRepetitionCEmodeB

Maximum value to indicate the set of PUSCH repetition numbers for CE mode B, see TS 36.211 [21] and TS 36.213 [23].

## sequenceHoppingEnabled

Parameter: Sequence-hopping-enabled, see TS 36.211 [21], clause 5.5.1.4.

#### sixToneCyclicShift, threeToneCyclicShift

Cyclic shift for PUSCH reference signal sequence of six/three subcarriers in CE mode A or B.

#### symPUSCH-UpPTS

Indicates the number of data symbols that configured for PUSCH transmission in UpPTS. Values *sym2*, *sym3*, *sym4*, *sym5* and *sym6* can be used for normal cyclic prefix, if *dmrsLess-UpPTS* is set to *true*, otherwise, values *sym2*, *sym3*, *sym4*, *sym5* can be used for normal cyclic prefix and values *sym1*, *sym2*, *sym3* and *sym4* can be used for extended cyclic prefix, see TS 36.213 [23], clause 8.6.2 and TS 36.211 [21], clause 5.3.4.

#### ul-DMRS-IFDMA

Value TRUE indicates that the UE is configured with enhanced UL DMRS.

## ul-ReferenceSignalsPUSCH

Used to specify parameters needed for the transmission on PUSCH (or PUCCH).

Conditional presence	Explanation
CE-ModeB	The field is optionally present, need ON, for CE Mode B. Otherwise, the field is not
	present.

# RACH-ConfigCommon

The IE RACH-ConfigCommon is used to specify the generic random access parameters.

## RACH-ConfigCommon information element

```
-- ASN1START
```

```
RACH-ConfigCommon ::=
                            SEQUENCE {
   preambleInfo
                                         SEQUENCE {
        numberOfRA-Preambles
                                            ENUMERATED {
                                                n4, n8, n12, n16, n20, n24, n28,
                                                n32, n36, n40, n44, n48, n52, n56,
                                                n60, n64},
        preamblesGroupAConfig
                                             SEQUENCE {
                                                ENUMERATED {
           sizeOfRA-PreamblesGroupA
                                                     n4, n8, n12, n16, n20, n24, n28,
                                                     n32, n36, n40, n44, n48, n52, n56,
                                                     n60},
            messageSizeGroupA
                                                     ENUMERATED {b56, b144, b208, b256},
            messagePowerOffsetGroupB
                                                ENUMERATED
                                                     minusinfinity, dB0, dB5, dB8, dB10, dB12,
                                                     dB15, dB18},
            . . .
        }
                    OPTIONAL
                                                                                  -- Need OP
    },
    powerRampingParameters
                                        PowerRampingParameters,
                                         SEQUENCE {
    ra-SupervisionInfo
       preambleTransMax
                                            PreambleTransMax,
        ra-ResponseWindowSize
                                             ENUMERATED
                                                sf2, sf3, sf4, sf5, sf6, sf7,
                                                sf8, sf10},
        mac-ContentionResolutionTimer
                                             ENUMERATED
                                                sf8, sf16, sf24, sf32, sf40, sf48,
                                                sf56, sf64}
    },
    maxHARQ-Msg3Tx
                                        INTEGER (1..8),
    [[ preambleTransMax-CE-r13
                                                                             OPTIONAL,
                                        PreambleTransMax
                                                                                         -- Need OR
        rach-CE-LevelInfoList-r13
                                        RACH-CE-LevelInfoList-r13
                                                                             OPTIONAL
                                                                                         -- Need OR
       edt-SmallTBS-Subset-r15
                                        ENUMERATED {true}
                                                                             OPTIONAL
                                                                                              -- Cond
    ]]]
EDT-OR
    ]]
```

}

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```
RACH-ConfigCommon-v1250 ::= SEQUENCE {
        connEstFailCount-r12 SEQUENCE {
    txFailParams-r12
                                                      ENUMERATED {n1, n2, n3, n4},
         connEstFailOffsetValidity-r12
                                                      ENUMERATED {s30, s60, s120, s240,
                                                               TED {s30, s00, s120, ______,
s300, s420, s600, s900},
ODTIONAL -- Need OP
        connEstFailOffset-r12
                                                      INTEGER (0..15) OPTIONAL
    }
}
RACH-ConfigCommonSCell-r11 ::= SEQUENCE {

powerRampingParameters-r11 PowerRampingParameters,

ra-SupervisionInfo-r11 SEQUENCE {

preambleTransMax_r11 PreambleTransMax
        preambleTransMax-r11
                                                      PreambleTransMax
    },
    . . .
}
RACH-CE-LevelInfoList-r13 ::= SEQUENCE (SIZE (1..maxCE-Level-r13)) OF RACH-CE-LevelInfo-r13
RACH-CE-LevelInfo-r13 ::= SEQUENCE {
preambleMappingInfo-r13 SEQ
                                  SEQUENCE {
                                                 INTEGER(0..63),
        firstPreamble-r13
         lastPreamble-r13
                                                  INTEGER(0..63)
    },
    ra-ResponseWindowSize-r13
                                           ENUMERATED {sf20, sf50, sf80, sf120, sf180,
                                                           sf240, sf320, sf400},
    mac-ContentionResolutionTimer-r13 ENUMERATED {sf80, sf100, sf120,
                                                           sf160, sf200, sf240, sf480, sf960},
    rar-HoppingConfig-r13
                                            ENUMERATED {on,off},
    ...,
[[ edt-Parameters-r15 SEQUENCE {
    edt-LastPreamble-r15 INTEGER(0..63),
    edt-SmallTBS-Enabled-r15 BOOLEAN,
    FNIMEPATED {b328, b
             edt-TBS-r15 ENUMERATED {b328, b408, b504, b600, b712,
             b808, b936, b1000or456},
mac-ContentionResolutionTimer-r15 ENUMERATED {sf240, sf480, sf960,
                                                          sf1920, sf3840, sf5760, sf7680, sf10240}
    OPTIONAL -- Need OP
          } OPTIONAL
                                  -- Cond EDT
    ]]
}
PowerRampingParameters ::= SEQUENCE {
    powerRampingStep ENUMER
                                         ENUMERATED {dB0, dB2,dB4, dB6},
    powerRampingStep
    preambleInitialReceivedTargetPower ENUMERATED {
                                                  dBm-120, dBm-118, dBm-116, dBm-114, dBm-112,
                                                  dBm-110, dBm-108, dBm-106, dBm-104, dBm-102,
                                                  dBm-100, dBm-98, dBm-96, dBm-94, dBm-92, dBm-90}
}
                                        ENUMERATED {
PreambleTransMax ::=
                                                  n3, n4, n5, n6, n7, n8, n10, n20, n50,
                                                  n100, n200}
```

-- ASN1STOP

	gCommon field descriptions
connEstFailCount	
Number of times that the UE detects T300 expiry or	n the same cell before applying connEstFailOffset.
connEstFailOffset	is not associat the value of infinity shall be used for "Ooffeet "
	is not present the value of infinity shall be used for "Qoffsettemp".
connEstFailOffsetValidity	
	set before removing the offset from evaluation of the cell. Value s3
corresponds to 30 seconds, s60 corresponds to 60	seconds, and so on.
edt-LastPreamble	
	ach CE level for EDT, as specified in TS 36.321 [6]. For the
	d by edt-PRACH-ParametersCE-r15 are different from the PRACH
	3 for all CE levels and edt-PRACH-ParametersCE-r15 for all other
	es firstPreamble-r13 to edt-LastPreamble-r15, otherwise the
preambles for EDT are the preambles lastPreamble	<i>er13</i> +1 to edt-LastPreamble-r15.
edt-SmallTBS-Enabled	
	ed to select TBS smaller than <i>edt-TBS</i> for Msg3 in the
corresponding CE level, as specified in TS 36.213 [	.23].
edt-SmallTBS-Subset	
	be used according to edt-TBS corresponding to the CE level, as
	esent, any of the TBS values according to edt-TBS corresponding
to the CE level can be used. This field is applicable	for a CE level only when edt-SmallTBS-Enabled is included for the
corresponding CE level.	
edt-TBS	
	a UE performing EDT. Value in bits. Value b328 corresponds to 32
bits, b408 corresponds to 408 bits and so on. Additi	ionally, value b1000or456 corresponds to 1000 bits for CE levels
and 1, and 456 bits for CE levels 2 and 3. See TS 3	
mac-ContentionResolutionTimer	
Timer for contention resolution in TS 36.321 [6]. Va	lue in subframes. Value sf8 corresponds to 8 subframes, sf16
	entionResolutionTimer-r15 is only applicable for EDT. UE
performing EDT shall use mac-ContentionResolution	
maxHARQ-Msg3Tx	
	TS 36.321 [6], used for contention based random access. Value i
an integer.	[1],
messagePowerOffsetGroupB	
	Value in dB. Value minusinfinity corresponds to –infinity. Value dB
corresponds to 0 dB, dB5 corresponds to 5 dB and	
messageSizeGroupA	
Threshold for preamble selection in TS 36.321 [6].	Value in bits. Value b56 corresponds to 56 bits, b144 corresponds
to 144 bits and so on.	
numberOfRA-Preambles	
Number of non-dedicated random access preamble	es in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4
n8 corresponds to 8 and so on.	
powerRampingStep	
	. Value dB0 corresponds to 0 dB, dB2 corresponds to 2 dB and so
on.	
preambleInitialReceivedTargetPower	
	Bm. Value dBm-120 corresponds to -120 dBm, dBm-118
corresponds to -118 dBm and so on.	
preambleMappingInfo	· · · · · · · · · · · · · · · · · · ·
	ach CE level, except for EDT, as specified in TS 36.321 [6]. Wher
	eamble-r13 is set to 0 and lastPreamble-r13 is set to numberOfRA
Preambles-1.	ample-173 is set to 0 and last reample-173 is set to number OFA
preamblesGroupAConfig	TO 26 221 [6] If the field is not signalled the size of the second
	TS 36.321 [6]. If the field is not signalled, the size of the random
access preambles group A, as specified in TS 36.3	
preambleTransMax, preambleTransMax-CE	
	36.321 [6]. Value is an integer. Value n3 corresponds to 3, n4
corresponds to 4 and so on.	
rach-CE-LevelInfoList	· · · · · · · · · · · · · · · · · · ·
	I. The first entry in the list contains RACH information of CE level
	tion of CE level 1, and so on. If E-UTRAN includes rach-CE-
LevelInfoList, it includes the same number of entrie	s as in prach-ParametersListCE.
ra-ResponseWindowSize	
Duration of the DA mean and a window in TO 00 004 (	(C1) Value in subframes, Value of $2$ correspondents 2 subframes, of
Duration of the RA response window in 15 36.321	(6). Value in subframes. Value siz corresponds to 2 subframes, si
	[6]. Value in subframes. Value sf2 corresponds to 2 subframes, sf value applies for each serving cell (although the associated

#### RACH-ConfigCommon field descriptions

# connEstFailCount Number of times that the UE detects T300 expiry on the same cell before applying connEstFailOffset. rar-HoppingConfig Frequency hopping activation/deactivation for RAR/Msg3/Msg4 for a CE level, see TS 36.211 [21]. sizeOfRA-PreamblesGroupA Size of the random access preambles group A in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4, n8

Size of the random access preambles group A in TS 36.321 [6]. Value is an integer. Value n4 corresponds to 4, n8 corresponds to 8 and so on.

Conditional presence	Explanation
EDT	The field is mandatory present if <i>cp-EDT</i> or <i>up-EDT</i> in <i>SystemInformationBlockType2</i> is present; otherwise the field is not present and the UE shall delete any existing value for this field.
EDT-OR	The field is optionally present, Need OR, if <i>cp-EDT</i> or <i>up-EDT</i> in <i>SystemInformationBlockType2</i> is present; otherwise the field is not present and the UE shall delete any existing value for this field.

# RACH-ConfigDedicated

The IE RACH-ConfigDedicated is used to specify the dedicated random access parameters.

#### RACH-ConfigDedicated information element

```
-- ASN1START

RACH-ConfigDedicated ::= SEQUENCE {

ra-PreambleIndex INTEGER (0..63),

ra-PRACH-MaskIndex INTEGER (0..15)

}
```

```
-- ASN1STOP
```

## RACH-ConfigDedicated field descriptions ra-PRACH-MaskIndex Explicitly signalled PRACH Mask Index for RA Resource selection in TS 36.321 [6].

ra-PreambleIndex

Explicitly signalled Random Access Preamble for RA Resource selection in TS 36.321 [6].

# RadioResourceConfigCommon

The IE *RadioResourceConfigCommonSIB* and IE *RadioResourceConfigCommon* are used to specify common radio resource configurations in the system information and in the mobility control information, respectively, e.g., the random access parameters and the static physical layer parameters.

#### RadioResourceConfigCommon information element

ASN1START			
RadioResourceConfigCommonSIB ::= SE	QUENCE {		
rach-ConfigCommon	RACH-ConfigCommon,		
bcch-Config BC	CH-Config,		
pcch-Config PC	CH-Config,		
prach-Config	PRACH-ConfigSIB,		
pdsch-ConfigCommon	PDSCH-ConfigCommon,		
pusch-ConfigCommon	PUSCH-ConfigCommon,		
pucch-ConfigCommon	PUCCH-ConfigCommon,		
soundingRS-UL-ConfigCommon	SoundingRS-UL-ConfigCommon,		
uplinkPowerControlCommon	UplinkPowerControlCommon,		
ul-CyclicPrefixLength	UL-CyclicPrefixLength,		
• • • • /			
[[ uplinkPowerControlCommon-v1020	UplinkPowerControlCommon-v1020	OPTIONAL	Need OR
]],			
[[ rach-ConfigCommon-v1250	RACH-ConfigCommon-v1250	OPTIONAL	Need OR
]],			
[[ pusch-ConfigCommon-v1270	PUSCH-ConfigCommon-v1270	OPTIONAL	Need OR

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	]],						
	]]	bcch-Config-v1310	BCCH-Config-v1310	OPTIONAL,		Need	OR
		pcch-Config-v1310	PCCH-Config-v1310	OPTIONAL,		Need	OR
		freqHoppingParameters-r13	FreqHoppingParameters-r13	OPTIONAL,		Need	OR
		pdsch-ConfigCommon-v1310	PDSCH-ConfigCommon-v1310	OPTIONAL,		Need	OR
		pusch-ConfigCommon-v1310	PUSCH-ConfigCommon-v1310	OPTIONAL,		Need	OR
		prach-ConfigCommon-v1310	PRACH-ConfigSIB-v1310	OPTIONAL,		Need	
		pucch-ConfigCommon-v1310	PUCCH-ConfigCommon-v1310	OPTIONAL		Need	
	]],	-		011101011			010
		highSpeedConfig-r14	HighSpeedConfig-r14	OPTIONAL,		Need	OR
		prach-Config-v1430	PRACH-Config-v1430	OPTIONAL,		Need	
		pucch-ConfigCommon-v1430	PUCCH-ConfigCommon-v1430	OPTIONAL		Need	
	]],			OFIIONAL		weed	OIC
		prach-Config-v1530	PRACH-ConfigSIB-v1530	OPTIONAL,		Cond	ਸ਼ਾਰਾਜ਼
	LL	ce-RSS-Config-r15	RSS-Config-r15	OPTIONAL,		Need	
		wus-Config-r15	WUS-Config-r15	OPTIONAL,		Need	
		highSpeedConfig-v1530	HighSpeedConfig-v1530	OPTIONAL,		Need	
	1 1	Inglispeedcolling=v1530	HIGHSpeedconiiig-visso	OPIIONAL		need	OR
	]],	unlinkperendentueldemmen ulf40	III-1 in h Devendent to a l German	ODUTONAT		Maad	
	[[	uplinkPowerControlCommon-v1540	UplinkPowerControlCommon-v1530	OPTIONAL		Need	OR
	]],	Gaufin all CO		ODETONIAL		NT]	0.5
	[[	wus-Config-v1560	WUS-Config-v1560	OPTIONAL		Need	OR
	]]						
}							
Rad		~ ~	UENCE {				
		h-ConfigCommon	RACH-ConfigCommon	OPTIONAL,		Need	ON
	pra	ch-Config	PRACH-Config,				
	pds	ch-ConfigCommon	PDSCH-ConfigCommon	OPTIONAL,		Need	ON
	pus	ch-ConfigCommon	PUSCH-ConfigCommon,				
	phi	ch-Config	PHICH-Config	OPTIONAL,		Need	ON
	puc	ch-ConfigCommon	PUCCH-ConfigCommon	OPTIONAL,		Need	ON
	-	ndingRS-UL-ConfigCommon	SoundingRS-UL-ConfigCommon	OPTIONAL,		Need	ON
		inkPowerControlCommon	UplinkPowerControlCommon	OPTIONAL,		Need	
	-	ennaInfoCommon	AntennaInfoCommon	OPTIONAL,		Need	
	p-Ma		P-Max	OPTIONAL,		Need	
	-	-Config	TDD-Config	OPTIONAL,		Cond	
		CyclicPrefixLength	UL-CyclicPrefixLength,	OF I LONAL,		cona	IDD
			on-cyclicplelixhengun,				
	•••	, uplinkPowerControlCommon-v1020	UplinkPowerControlCommon-v1020			Nood	ON
		upilikpowerconcroiconanon-viozo	Optimerconcroiconan-viozo	OPTIONAL		Need	OIN
	]],		TTTT ( 5' 1120	0000000		a 1	
		tdd-Config-v1130	TDD-Config-v1130	OPTIONAL		Cond	.T.DD.3
	]],	1					
		pusch-ConfigCommon-v1270	PUSCH-ConfigCommon-v1270	OPTIONAL		Need	OR
	]],						
	[[						
		prach-Config-v1310	PRACH-Config-v1310	OPTIONAL,		Need	ON
		freqHoppingParameters-r13	FreqHoppingParameters-r13	OPTIONAL,		Need	ON
		pdsch-ConfigCommon-v1310	PDSCH-ConfigCommon-v1310	OPTIONAL,		Need	
		pucch-ConfigCommon-v1310	PUCCH-ConfigCommon-v1310	OPTIONAL,		Need	ON
		pusch-ConfigCommon-v1310	PUSCH-ConfigCommon-v1310	OPTIONAL,		Need	ON
		uplinkPowerControlCommon-v1310	UplinkPowerControlCommon-v1310	OPTIONAL		Need	ON
	]],						
		highSpeedConfig-r14	HighSpeedConfig-r14	OPTIONAL,		Need	OR
		prach-Config-v1430	PRACH-Config-v1430	OPTIONAL,		Need	OR
		pucch-ConfigCommon-v1430	PUCCH-ConfigCommon-v1430	OPTIONAL,		Need	OR
		tdd-Config-v1430	TDD-Config-v1430	OPTIONAL		Cond	
	]],						
	[[						
		tdd-Config-v1450	TDD-Config-v1450	OPTIONAL		Cond	TDD3
	]],			51 1 2 514111			
	[[	uplinkPowerControlCommon-v1530	UplinkPowerControlCommon-v1530	OPTIONAL,		Need	ON
		highSpeedConfig-v1530	HighSpeedConfig-v1530	OPTIONAL,		Need	
	]]			01 1 1 010/111			0.11
}							
1							
Pad	ioPor	sourceConfigCommonPSCell-r12 ::=	SFOURNOR {				
кац		icFields-r12	RadioResourceConfigCommonSCell-	r10			
				110,			
	-	ch-ConfigCommon-r12	PUCCH-ConfigCommon,				
		h-ConfigCommon-r12	RACH-ConfigCommon,				
	-		UplinkPowerControlCommonPSCell-	r12,			
	•••		1.21.0				
	ll	uplinkPowerControlCommonPSCell-		00000000		1 017	
		Upl	inkPowerControlCommon-v1310	OPTIONAL	Need	i ON	
	]],		1500				
	[[	uplinkPowerControlCommonPSCell-					
		Upl	inkPowerControlCommon-v1530	OPTIONAL	Need	I ON	
	]]						
}							

RadioResourceConfigCommonPSCell-v12f0 ::= SEQUENCE { basicFields-v12f0 RadioResourceConfigCommonSCell-v1010 } RadioResourceConfigCommonPSCell-v1440 ::= SEQUENCE { basicFields-v1440 RadioResourceConfigCommonSCell-v1440 } RadioResourceConfigCommonSCell-r10 ::= SEQUENCE { -- DL configuration as well as configuration applicable for DL and UL SEQUENCE { nonUL-Configuration-r10 -- 1: Cell characteristics dl-Bandwidth-r10 ENUMERATED {n6, n15, n25, n50, n75, n100}, -- 2: Physical configuration, general mbsfn-SubframeConfigList-r10 AntennaInfoCommon, MBSFN-SubframeConfigList OPTIONAL, -- Need OR -- 3: Physical configuration, control phich-Config-r10 PHICH-Config, -- 4: Physical configuration, physical channels PDSCH-ConfigCommon, pdsch-ConfigCommon-r10 tdd-Config-r10 TDD-Config OPTIONAL -- Cond TDDSCell }, -- UL configuration ul-Configuration-r10 -- UL configuration SEQUENCE { ul-FreqInfo-r10 SEQUENCE { ul-CarrierFreq-r10 ARFCN-ValueEUTRA OPTIONAL, -- Need OP ul-Bandwidth-r10 ENUMERATED {n6, n15, n25, n50, n75, n100} OPTIONAL, -- Need OP additionalSpectrumEmissionSCell-r10 AdditionalSpectrumEmission }, p-Max-r10 OPTIONAL, -- Need OP P-Max uplinkPowerControlCommonSCell-r10 UplinkPowerControlCommonSCell-r10, -- A special version of IE UplinkPowerControlCommon may be introduced -- 3: Physical configuration, control soundingRS-UL-ConfigCommon-r10 SoundingRS-UL-ConfigCommon, ul-CyclicPrefixLength-r10 UL-CyclicPrefixLength, -- 4: Physical configuration, physical channels prach-ConfigSCell-r10 PRACH-ConfigSCell-r10 OPTIONAL, -- Cond TDD-OR-NoR11 PUSCH-ConfigCommon pusch-ConfigCommon-r10 } OPTIONAL. -- Need OR [[ ul-CarrierFreq-v1090 ARFCN-ValueEUTRA-v9e0 OPTIONAL -- Need OP ]], [[ rach-ConfigCommonSCell-r11 RACH-ConfigCommonSCell-r11 OPTIONAL, -- Cond ULSCell prach-ConfigSCell-r11 OPTIONAL, PRACH-Config -- Cond UL tdd-Config-v1130 TDD-Config-v1130 OPTIONAL, -- Cond TDD2 uplinkPowerControlCommonSCell-v1130 UplinkPowerControlCommonSCell-v1130 OPTIONAL -- Cond UL ]], pusch-ConfigCommon-v1270 PUSCH-ConfigCommon-v1270 OPTIONAL -- Need OR 11 ]], [[ pucch-ConfigCommon-r13 PUCCH-ConfigCommon OPTIONAL, -- Cond UL uplinkPowerControlCommonSCell-v1310 UplinkPowerControlCommonSCell-v1310 OPTIONAL -- Cond UL 11, 
 II,
 highSpeedConfigSCell-r14
 HighSpeedConfigSCell-r14

 prach-Config-v1430
 PRACH-Config-v1430

 ul-Configuration-r14
 SEQUENCE {
 OPTIONAL. -- Need OR OPTIONAL, -- Cond UL SEQUENCE { ul-FreqInfo-r14 ul-CarrierFreq-r14 ARFCN-ValueEUTRA-r9 OPTIONAL, -- Need OP ENUMERATED {n6, n15, ul-Bandwidth-r14 n25, n50, n75, n100} OPTIONAL, -- Need OP additionalSpectrumEmissionSCell-r14 AdditionalSpectrumEmission }, p-Max-r14 P-Max OPTIONAL. -- Need OP ul-CyclicPrefixLength-r14 UL-CyclicPrefixLength, prach-ConfigSCell-r14 SoundingRS-UL-ConfigCommon, PRACH-ConfigSCell-r10 OPTIONAL, -- Cond TDDprach-ConfigSCell-r14 OR-NoR11 uplinkPowerControlCommonPUSCH-LessCell-v1430 OPTIONAL OPTIONAL -- Need OR OPTIONAL, -- Cond ULSRS UplinkPowerControlCommonPUSCH-LessCell-v1430 } harq-ReferenceConfig-r14 ENUMERATED {sa2,sa4,sa5} OPTIONAL, -- Need OR

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```
soundingRS-FlexibleTiming-r14 ENUMERATED {true} OPTIONAL -- Need OR
   11,
   [[ mbsfn-SubframeConfigList-v1430
                                      MBSFN-SubframeConfigList-v1430
                                                                         OPTIONAL -- Need ON
   ]],
      uplinkPowerControlCommonSCell-v1530 UplinkPowerControlCommon-v1530
                                                                         OPTIONAL -- Need ON
   [[
   ]]
}
RadioResourceConfigCommonSCell-v1010 ::= SEQUENCE {
   ul-Configuration-v1010
                                   SEQUENCE {
       additionalSpectrumEmissionSCell-v1010
                                               AdditionalSpectrumEmission-v1010
   }
}
RadioResourceConfigCommonSCell-v1440 ::= SEQUENCE {
   ul-Configuration-v1440 SEQUENCE {
       ul-FreqInfo-v1440
                                           SEQUENCE {
          additionalSpectrumEmissionSCell-v1440 AdditionalSpectrumEmission-v1010
       }
   }
}
BCCH-Config ::=
                                 SEQUENCE {
   modificationPeriodCoeff
                                   ENUMERATED {n2, n4, n8, n16}
}
BCCH-Config-v1310 ::=
                                SEQUENCE {
   modificationPeriodCoeff-v1310
                                 ENUMERATED {n64}
}
                               SEQUENCE {
FreqHoppingParameters-r13 ::=
   dummyENUMERATED {nb2, nb4}dummy2CHOICE {
                                                  OPTIONAL,
                                            ENUMERATED {int1, int2, int4, int8},
ENUMERATED {int1, int5, int10, int20}
       interval-FDD-r13
       interval-TDD-r13
                                                                      OPTIONAL,
   dummy3
                 CHOICE {
      interval-FDD-r13
                                            ENUMERATED {int2, int4, int8, int16},
                                            ENUMERATED { int5, int10, int20, int40}
       interval-TDD-r13
                                                                       OPTIONAL.
   interval-ULHoppingConfigCommonModeA-r13 CHOICE {
                                            ENUMERATED {int1, int2, int4, int8},
      interval-FDD-r13
                                            ENUMERATED {int1, int5, int10, int20}
       interval-TDD-r13
                                                                      OPTIONAL, -- Cond MP-A
   interval-ULHoppingConfigCommonModeB-r13 CHOICE {
                                     ENUMERATED {int2, int4, int8, int16},
      interval-FDD-r13
       interval-TDD-r13
                                            ENUMERATED { int5, int10, int20, int40}
                                                                      OPTIONAL, -- Cond MP-B
                 INTEGER (1..maxAvailNarrowBands-r13)
   dummv4
                                                                 OPTIONAL
}
PCCH-Config ::=
                                SEQUENCE {
   defaultPagingCycle
                                    ENUMERATED {
                                       rf32, rf64, rf128, rf256},
                                     ENUMERATED {
   nB
                                        fourT, twoT, oneT, halfT, quarterT, oneEighthT,
                                        oneSixteenthT, oneThirtySecondT}
}
   paging-narrowBands-r13 pagence {
PCCH-Config-v1310 ::=
                                  INTEGER (1..maxAvailNarrowBands-r13),
   mpdcch-NumRepetition-Paging-r13
                                    ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, r256},
                                    ENUMERATED {one64thT, one128thT, one256thT}
   nB-v1310
                                                                      OPTIONAL.
                                                                                -- Need OR
}
UL-CyclicPrefixLength ::=
                                ENUMERATED {len1, len2}
                            SEQUENCE {
HighSpeedConfig-r14 ::=
                                                          OPTIONAL, -- Need OR
   highSpeedEnhancedMeasFlag-r14
                                        ENUMERATED {true}
   highSpeedEnhancedDemodulationFlag-r14 ENUMERATED {true}
                                                                      OPTIONAL
                                                                                 -- Need OR
}
HighSpeedConfig-v1530 ::= SEQUENCE {
  highSpeedMeasGapCE-ModeA-r15
                                        ENUMERATED {true}
}
```

```
HighSpeedConfigSCell-r14 ::= SEQUENCE {
highSpeedEnhancedDemodulationFlag-r14 ENUMERATED {true} OPTIONAL -- Need OR
}
```

-- ASN1STOP

RadioResourceConfigCommon field descriptions	
additionalSpectrumEmissionSCell The UE requirements related to additionalSpectrumEmissionSCell are defined in TS 36.101 [42]. E-UTRAN con the same value in additionalSpectrumEmissionSCell for all SCell(s) of the same band with UL configured. The additionalSpectrumEmissionSCell is applicable for all serving cells (including PCell) of the same band with UL configured.	figures
defaultPagingCycle	
Default paging cycle, used to derive 'T' in TS 36.304 [4]. Value rf32 corresponds to 32 radio frames, rf64 corresp to 64 radio frames and so on.	oonds
dummy	
This field is not used in the specification. If received it shall be ignored by the UE.	
<i>harq-ReferenceConfig</i> Indicates UL/ DL configuration used as the DL HARQ reference configuration for this serving cell. Value sa2 corresponds to Configuration2, sa4 to Configuration4 etc, as specified in TS 36.211 [21], table 4.2-2. E-UTRAN configures the same value for all serving cells residing on same frequency band.	
highSpeedEnhancedMeasFlag	
If the field is present, the UE shall apply the high speed measurement enhancements as specified in TS 36.133	[16]
highSpeedEnhancedDemodulationFlag	[10].
If the field is present, the UE shall apply the advanced receiver in SFN scenario as specified in TS 36.101 [6].	
highSpeedMeasGapCE-ModeA	
If the field is present, the UE in CE mode A shall apply the measurement gap sharing table associated with high velocity scenario for measurements, as specified in TS 36.133 [16].	-
interval-DLHoppingConfigCommonModeX	
Number of consecutive absolute subframes over which MPDCCH or PDSCH for CE mode X stays at the same narrowband before hopping to another narrowband. For interval-FDD, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For interval-TDD, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on.	5
interval-ULHoppingConfigCommonModeX	
Number of consecutive absolute subframes over which PUCCH or PUSCH for CE mode X stays at the same narrowband before hopping to another narrowband. For interval-FDD, int1 corresponds to 1 subframe, int2 corresponds to 2 subframes, and so on. For interval-TDD, int1 corresponds to 1 subframe, int5 corresponds to 5 subframes, and so on.	5
modificationPeriodCoeff	
Actual modification period, expressed in number of radio frames= <i>modificationPeriodCoeff</i> * <i>defaultPagingCycle</i> corresponds to value 2, n4 corresponds to value 4, n8 corresponds to value 8, n16 corresponds to value 16, and corresponds to value 64.	
mpdcch-NumRepetition-Paging	
Maximum number of repetitions for MPDCCH common search space (CSS) for paging, see TS 36.211 [21]. mpdcch-pdsch-HoppingOffset	
Parameter: $\int_{NB,hop}^{DL}$ , see TS 36.211 [21], clause 6.4.1.	
mpdcch-pdsch-HoppingNB	
The number of narrowbands for MPDCCH/PDSCH frequency hopping. Value nb2 corresponds to 2 narrowbands value nb4 corresponds to 4 narrowbands.	s and
<b>nB</b> Parameter: nB is used as one of parameters to derive the Paging Frame and Paging Occasion according to TS 36.304 [4]. Value in multiples of 'T' as defined in TS 36.304 [4]. A value of fourT corresponds to 4 * T, a value of corresponds to 2 * T and so on. In case <i>nB-v1310</i> is signalled, the UE shall ignore <i>nB</i> (i.e. without suffix). EUTR configures <i>nB-v1310</i> only in the BR version of SI message.	twoT AN
<b>paging-narrowBands</b> Number of narrowbands used for paging, see TS 36.304 [4], TS 36.212 [22] and TS 36.213 [23].	
p-Max	
Pmax to be used in the target cell. If absent, for the band used in the target cell, the UE applies the maximum por according to its capability as specified in 36.101 [42], clause 6.2.2. In case the UE is configured with uplink intra- contiguous CA and the UE indicates <i>ue-CA-PowerClass-N</i> in that band combination, then the <i>p-Max</i> in <i>RadioResourceConfigCommonSCell</i> for that SCell, if present, also applies for that band combination whenever the SCell is activated.	-band
prach-ConfigSCell Indicates a PRACH configuration for an SCell. The field is not applicable for an LAA SCell in this release.	
rach-ConfigCommonSCell	
Indicates a RACH configuration for an SCell. The field is not applicable for an LAA SCell in this release. soundingRS-FlexibleTiming	
Indicates the SRS flexible timing (if configured) for aperiodic SRS triggered by DL grant. If the SRS transmission collided with ACK/NACK, postpone once to the next configured SRS transmission opportunity.	n is

#### RadioResourceConfigCommon field descriptions

#### additionalSpectrumEmissionSCell

The UE requirements related to *additionalSpectrumEmissionSCell* are defined in TS 36.101 [42]. E-UTRAN configures the same value in *additionalSpectrumEmissionSCell* for all SCell(s) of the same band with UL configured. The *additionalSpectrumEmissionSCell* is applicable for all serving cells (including PCell) of the same band with UL configured.

#### ul-Bandwidth

Parameter: transmission bandwidth configuration,  $N_{RB}$ , in uplink, see TS 36.101 [42], table 5.6-1. Value n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on. If for FDD this parameter is absent, the uplink bandwidth is equal to the downlink bandwidth. For TDD this parameter is absent and it is equal to the downlink bandwidth.

# ul-CarrierFreq

For FDD: If absent, the (default) value determined from the default TX-RX frequency separation defined in TS 36.101 [42], table 5.7.3-1, applies.

For TDD: This parameter is absent and it is equal to the downlink frequency.

#### ul-CyclicPrefixLength

Parameter: Uplink cyclic prefix length see TS 36.211 [21], clause 5.2.1, where len1 corresponds to normal cyclic prefix and len2 corresponds to extended cyclic prefix.

Conditional presence	Explanation
EDT	The field is optionally present, Need OR, if edt-Parameters is present; otherwise the field
	is not present and the UE shall delete any existing value for this field.
MP-A	The field is mandatory present for CE mode A. Otherwise the field is optional, Need OR.
MP-B	The field is mandatory present for CE mode B. Otherwise the field is optional, Need OR.
TDD	The field is optional for TDD, Need ON; it is not present for FDD and the UE shall delete any existing value for this field.
TDD2	If <i>tdd-Config-r10</i> is present, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field.
TDD3	If <i>tdd-Config</i> is present, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field.
TDD-OR-NoR11	If <i>prach-ConfigSCell-r11</i> is absent, the field is optional for TDD, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field.
TDDSCell	This field is mandatory present for TDD; it is not present for FDD and LAA SCell, and the UE shall delete any existing value for this field.
UL	If the SCell is part of the STAG or concerns the PSCell or PUCCH SCell and if <i>ul-Configuration</i> is included, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field.
ULSCell	For the PSCell (IE is included in <i>RadioResourceConfigCommonPSCell</i> ) the field is absent. Otherwise, if the SCell is part of the STAG and if <i>ul-Configuration</i> is included, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field.
ULSRS	If <i>ul-Configuration-r10</i> is absent, the field is optional, Need OR. Otherwise the field is not present and the UE shall delete any existing value for this field.

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-- ASN1START

# RadioResourceConfigDedicated

The IE *RadioResourceConfigDedicated* is used to setup/modify/release RBs, to modify the MAC main configuration, to modify the SPS configuration and to modify dedicated physical configuration.

#### RadioResourceConfigDedicated information element

RadioResourceConfigDedicated ::= srb-ToAddModList drb-ToAddModList	SEQUENCE { SRB-ToAddModList DRB-ToAddModList	OPTIONAL, OPTIONAL,	Cond HO-Conn Cond HO-
toEUTRA			
drb-ToReleaseList mac-MainConfig explicitValue defaultValue } OPTIONAL,	DRB-TOReleaseList CHOICE { MAC-MainConfig, NULL	OPTIONAL,	Need ON Cond HO-
toEUTRA2			
sps-Config physicalConfigDedicated	SPS-Config PhysicalConfigDedicated	OPTIONAL, OPTIONAL,	Need ON Need ON
• • • • /			

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	[[ ]],	rlf-TimersAndConstants-r9	RLF-TimersAndConstants-r9	OPTIONAL Ne	ed ON
	[[]],	measSubframePatternPCell-r10	MeasSubframePatternPCell-r10	OPTIONAL Ne	ed ON
		neighCellsCRS-Info-r11	NeighCellsCRS-Info-r11	OPTIONAL Ne	ed ON
	]],	naics-Info-r12 NAI	CS-AssistanceInfo-r12	OPTIONAL Need O	N
an	]]	neighCellsCRS-Info-r13	NeighCellsCRS-Info-r13	OPTIONAL, Co	ond
CR	SIM	rlf-TimersAndConstants-r13	RLF-TimersAndConstants-r13	OPTIONAL Ne	ed ON
	]], [[	sps-Config-v1430	SPS-Config-v1430	OPTIONAL Co	ond SPS
	]], [[	srb-ToAddModListExt-r15 srb-ToReleaseListExt-r15	SRB-ToAddModListExt-r15 INTEGER (4)		ed ON ed ON
		sps-Config-v1530	SPS-Config-v1530	OPTIONAL, Ne	ed ON
		-	L, DICE { crs-IntfMit	igEnabled-15 NULL,	
		crs-IntfMitigNumPRBs-r1	5 ENUMERATED {n6, n24}		
		} neighCellsCRS-Info-r15 drb-ToAddModList-r15	NeighCellsCRS-Info-r15 OP	Need ON FIONAL, Need ON FIONAL, Need O	N
		drb-ToReleaseList-r15 dummy		FIONAL, Need O	
Ne	ed ON	Г ⁻			
ı	]], [[ ]]	sps-Config-v1540	SPS-Config-v1540	OPTIONAL Ne	ed ON
} 	14 - 7 -				
Ra }		sourceConfigDedicated-v1370 ::= sicalConfigDedicated-v1370	SEQUENCE { PhysicalConfigDedicated-v1370	OPTIONAL Ne	ed ON
Ra }		sourceConfigDedicated-v13c0 ::= sicalConfigDedicated-v13c0	SEQUENCE { PhysicalConfigDedicated-v13c0		
Ra	dioRe	sourceConfigDedicatedPSCell-r12	::= SEQUENCE {		
		UE specific configuration extens sicalConfigDedicatedPSCell-r12	ions applicable for an PSCell PhysicalConfigDedicated	OPTIONAL, Need O	M
	sps	-Config-r12	SPS-Config	OPTIONAL, Need O	N
			NAICS-AssistanceInfo-r12	OPTIONAL, Need O	
	]],		NeighCellsCRS-Info-r13	OPTIONAL Need O	
	[[ ]],	sps-Config-v1430	SPS-Config-v1430	OPTIONAL Cond S	SPS2
	[[	sps-Config-v1530 crs-IntfMitigEnabled-r15	SPS-Config-v1530 BOOLEAN	OPTIONAL, Need O OPTIONAL, Need O	
	]],	neighCellsCRS-Info-r15	NeighCellsCRS-Info-r15	OPTIONAL Need O	DN
}	[[ ]]	sps-Config-v1540	SPS-Config-v1540	OPTIONAL Need O	DN
	dioRe	sourceConfigDedicatedPSCell-v137	0 ::= SEQUENCE {		
}		sicalConfigDedicatedPSCell-v1370		370 OPTIONAL Ne	ed ON
Ra }		sourceConfigDedicatedPSCell-v13c sicalConfigDedicatedPSCell-v13c0		3c0	
Ra	drb mac	sourceConfigDedicatedSCG-r12 ::= -ToAddModListSCG-r12 -MainConfigSCG-r12 -TimorgAndConstantsSCC-r12	DRB-ToAddModListSCG-r12 MAC-MainConfig	OPTIONAL, Need O OPTIONAL, Need O OPTIONAL Need O	N
	 [[	drb-ToAddModListSCG-r15	RLF-TimersAndConstantsSCG-r12 DRB-ToAddModListSCG-r15	OPTIONAL, Need O OPTIONAL Need O	
	]], [[	srb-ToAddModListSCG-r15	SRB-ToAddModList	OPTIONAL, Ne	ed ON

```
srb-ToReleaseListSCG-r15 SRB-ToReleaseList-r15
                                                                         OPTIONAL -- Need
ON
   11,
   [[ -- NE-DC additions for release of RLC bearer config for DRBs
       drb-ToReleaseListSCG-r15 DRB-ToReleaseList-r15 OPTIONAL
                                                                             -- Need ON
   11
}
RadioResourceConfigDedicatedSCell-r10 ::= SEQUENCE {
    - UE specific configuration extensions applicable for an SCell
   physicalConfigDedicatedSCell-r10 PhysicalConfigDedicatedSCell-r10 OPTIONAL, -- Need
ON
   [[ mac-MainConfigSCell-r11 MAC-MainConfigSCell-r11
                                                                 OPTIONAL -- Cond SCellAdd
   ]],
   [[ naics-Info-r12
                                NAICS-AssistanceInfo-r12
                                                             OPTIONAL -- Need ON
   ]],
   [[ neighCellsCRS-InfoSCell-r13 NeighCellsCRS-Info-r13 OPTIONAL -- Need ON
   11.
   [[ physicalConfigDedicatedSCell-v1370 PhysicalConfigDedicatedSCell-v1370 OPTIONAL -- Need
ON
   ]],
   [[ crs-IntfMitigEnabled-r15
                                        BOOLEAN OPTIONAL, OPTIONAL, OPTIONAL,
                                                                              -- Need ON
       neighCellsCRS-Info-r15
                                                                              -- Need ON
       sps-Config-v1530
                                                                              -- Need ON
   11
}
RadioResourceConfigDedicatedSCell-v13c0 ::= SEQUENCE {
   physicalConfigDedicatedSCell-v13c0 PhysicalConfigDedicatedSCell-v13c0
}
SRB-ToAddModList ::=
                                SEQUENCE (SIZE (1..2)) OF SRB-ToAddMod
SRB-ToAddModListExt-r15 ::=
                                    SEQUENCE (SIZE (1)) OF SRB-ToAddMod
SRB-ToAddMod ::= SEQUENCE {
   srb-Identity
                                     INTEGER (1..2),
   rlc-Config
                                     CHOICE {
                                       RLC-Config,
       explicitValue
       defaultValue
                                        NULL
          OPTIONAL.
                                                                              -- Cond Setup
   logicalChannelConfig
                                   CHOICE {
       explicitValue
                                        LogicalChannelConfig,
       defaultValue
                                        NULL
   }
          OPTIONAL,
                                                                              -- Cond Setup
   [[ pdcp-verChange-r15 ENUMERATED {true} OPTIONAL,
rlc-Config-v1530 BLC-Config-v1530 OPTIONAL.
                                                                              -- Cond NR-PDCP
       rlc-Config-v1530
                                    RLC-Config-v1530
                                                           OPTIONAL,
                                                                              -- Need ON
       rlc-BearerConfigSecondary-r15 RLC-BearerConfig-r15 OPTIONAL,
                                                                              -- Need ON
       srb-Identity-v1530 INTEGER (4)
                                                          OPTIONAL
                                                                              -- Need ON
   11,
   [[ rlc-Config-v1560
                                        RLC-Config-v1510
                                                             OPTIONAL
                                                                              -- Need ON
   11
}
DRB-ToAddModList ::=
                                SEQUENCE (SIZE (1..maxDRB)) OF DRB-ToAddMod
                            SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-ToAddMod
DRB-ToAddModList-r15 ::=
DRB-ToAddModListSCG-r12 ::= SEQUENCE (SIZE (1..maxDRB)) OF DRB-ToAddModSCG-r12
DRB-ToAddModListSCG-r15 ::=
                            SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-ToAddModSCG-r12
DRB-ToAddMod ::=
                 SEQUENCE {
   eps-BearerIdentity
                                     INTEGER (0..15) OPTIONAL,
                                                                         -- Cond DRB-Setup
                                     DRB-Identity,
   drb-Identity
                                                          OPTIONAL,
   pdcp-Config
                                    PDCP-Config
                                                                          -- Cond PDCP
                                    RLC-Config OPTIONAL,
INTEGER (3..10) OPTIONAL,
                                                                          -- Cond SetupM
   rlc-Config
   logicalChannelIdentity
                                                                          -- Cond DRB-SetupM
                               LogicalChannelConfig OPTIONAL,
   logicalChannelConfig
                                                                          -- Cond SetupM
   [[ drb-TypeChange-r12
                                      ENUMERATED {toMCG} OPTIONAL,
                                                                              -- Need OP
       rlc-Config-v1250
                                        RLC-Config-v1250
                                                              OPTIONAL
                                                                              -- Need ON
   11,
                                                             OPTIONAL,
OPTIONAL,
   [[ rlc-Config-v1310
                                        RLC-Config-v1310
                                                                             -- Need ON
-- Need ON
       drb-TypeLWA-r13
                                        BOOLEAN
                                        ENUMERATED {lwip, lwip-DL-only,
       drb-TypeLWIP-r13
                                        lwip-UL-only, eutran} OPTIONAL
                                                                                 -- Need ON
```

```
]],
```

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```
[[ rlc-Config-v1430
                                           RLC-Config-v1430
                                                                   OPTIONAL,
                                                                                    -- Need ON
        lwip-UL-Aggregation-r14
                                            BOOLEAN
                                                                    OPTIONAL,
                                                                                    -- Cond LWIP
        lwip-DL-Aggregation-r14
                                           BOOLEAN
                                                                   OPTIONAL,
                                                                                    -- Cond LWIP
        lwa-WLAN-AC-r14
                              ENUMERATED {ac-bk, ac-be, ac-vi, ac-vo} OPTIONAL
                                                                                    -- Cond UL-LWA
    11,
    [[ rlc-Config-v1510
                                           RLC-Config-v1510
                                                                   OPTIONAL
                                                                                    -- Need ON
    ]],
                                                                   OPTIONAL,
                                           RLC-Config-v1530
                                                                                    -- Need ON
    [[ rlc-Config-v1530
        rlc-BearerConfigSecondary-r15
                                           RLC-BearerConfig-r15
                                                                   OPTIONAL,
                                                                                    -- Need ON
        logicalChannelIdentity-r15
                                       INTEGER (32..38)
                                                                    OPTIONAL
                                                                                    -- Need ON
    11
}
DRB-ToAddModSCG-r12 ::= SEQUENCE {
    drb-Identity-r12
                                        DRB-Identity,
    drb-Type-r12
                                        CHOICE {
        split-r12
                                           NULT.
        scg-r12
                                            SEQUENCE {
                                                INTEGER (0..15) OPTIONAL, -- Cond DRB-Setup
           eps-BearerIdentity-r12
           pdcp-Config-r12
                                                PDCP-Config
                                                               OPTIONAL
                                                                            -- Cond PDCP-S
        }
                                                               OPTIONAL, -- Cond SetupS2
OPTIONAL, -- Cond SetupS
    }
                                       RLC-Config
    rlc-ConfigSCG-r12
   rlc-Config-v1250
                                           RLC-Config-v1250
                                                                      OPTIONAL, -- Need ON
    logicalChannelIdentitySCG-r12
                                                                OPTIONAL,
                                                                          -- Cond DRB-SetupS
                                        INTEGER (3..10)
    logicalChannelConfigSCG-r12
                                        LogicalChannelConfig
                                                                OPTIONAL,
                                                                            -- Cond SetupS
    [[ rlc-Config-v1430
                                           RLC-Config-v1430
                                                                   OPTIONAL
                                                                                    -- Need ON
    11,
                                            RLC-Config-v1530 OPTIONAL,
    [[ logicalChannelIdentitySCG-r15
                                           INTEGER (32..38)
                                                                                    -- Need ON
        rlc-Config-v1530
                                                                   OPTIONAL,
                                                                                    -- Need ON
       rlc-BearerConfigSecondary-r15
                                           RLC-BearerConfig-r15
                                                                                    -- Need ON
                                                                   OPTIONAL
    ]],
    [[ rlc-Config-v1560
                                                                   OPTIONAL
                                                                                    -- Need ON
                                           RLC-Config-v1510
    ]]
}
                                    SEQUENCE (SIZE (1..maxDRB)) OF DRB-Identity
DRB-ToReleaseList ::=
                                   SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-Identity
DRB-ToReleaseList-r15 ::=
SRB-ToReleaseList-r15 ::=
                                    SEQUENCE (SIZE (1..2)) OF INTEGER (1..2)
MeasSubframePatternPCell-r10 ::=
                                        CHOICE {
    release
                                        NULL,
    setup
                                    MeasSubframePattern-r10
}
NeighCellsCRS-Info-r11 ::=
                                CHOICE {
                                    NULL
    release
    setup
                                    CRS-AssistanceInfoList-r11
}
CRS-AssistanceInfoList-r11 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r11
CRS-AssistanceInfo-r11 ::= SEQUENCE {
                                        PhysCellId,
ENUMERATED {an1, an2, an4, spare1},
    physCellId-r11
    antennaPortsCount-r11
    mbsfn-SubframeConfigList-r11
                                       MBSFN-SubframeConfigList,
    [[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430 OPTIONAL -- Need ON
    ]]
}
NeighCellsCRS-Info-r13 ::=
                                CHOICE {
   release
                                    NULL
                                    CRS-AssistanceInfoList-r13
    setup
}
CRS-AssistanceInfoList-r13 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r13
CRS-AssistanceInfo-r13 ::= SEQUENCE {
   physCellId-r13
                                        PhysCellId,
    antennaPortsCount-r13
                                        ENUMERATED {an1, an2, an4, spare1},
    mbsfn-SubframeConfigList-r13
                                        MBSFN-SubframeConfigList
                                                                            OPTIONAL,
                                                                                        -- Need ON
    [[ mbsfn-SubframeConfigList-v1430 MBSFN-SubframeConfigList-v1430
                                                                            OPTIONAL
                                                                                        -- Need ON
    11
}
```

```
NeighCellsCRS-Info-r15 ::= CHOICE {
   release
                                               NULL,
                                               CRS-AssistanceInfoList-r15
    setup
}
CRS-AssistanceInfoList-r15 ::= SEQUENCE (SIZE (1..maxCellReport)) OF CRS-AssistanceInfo-r15
CRS-AssistanceInfo-r15 ::= SEQUENCE {
    physCellId-r15
                                               PhysCellId,
    crs-IntfMitigEnabled-15
                                               ENUMERATED {enabled}
                                                                                       OPTIONAL -- Need ON
}
NAICS-AssistanceInfo-r12 ::=
                                         CHOICE {
         aase NULL,

up SEQUENCE {

neighCellsToReleaseList-r12 NeighCellsToReleaseList-r12 OPTIONAL, -- Need ON

NeighCellsToAddModList-r12 OPTIONAL, -- Need ON

OPTIONAL -- Need ON
    release
    setup
    }
}
NeighCellsToReleaseList-r12 ::= SEQUENCE (SIZE (1..maxNeighCell-r12)) OF PhysCellId
NeighCellsToAddModList-r12 ::= SEQUENCE (SIZE (1..maxNeighCell-r12)) OF NeighCellsInfo-r12
NeighCellsInfo-r12 ::=
                                       SEQUENCE {
   physCellId-r12
                                        PhysCellId,
                                       INTEGER (0..3),
    p-b-r12
    p-b-f12INTEGER (0.13),crs-PortsCount-r12ENUMERATED {n1, n2, n4, spare},mbsfn-SubframeConfig-r12MBSFN-SubframeConfigListp-aList-r12SEQUENCE (SIZE (1..maxP-a-PerNeitransmissionModeList-r12BIT STRING (SIZE(8)),resAllocGranularity-r12INTEGER (1..4),
    crs-PortsCount-r12
                                                                                         OPTIONAL, -- Need ON
                                       SEQUENCE (SIZE (1..maxP-a-PerNeighCell-r12)) OF P-a,
    . . .
P-a ::= ENUMERATED { dB-6, dB-4dot77, dB-3, dB-1dot77,
                                          dB0, dB1, dB2, dB3
RLC-BearerConfig-r15 ::=
                                          CHOICE {
    release
                                            NULL,
         logicalChannelIdentityConfig-r15 INTEGER (1.10)
    setup
             logicalChannelIdentity-r15 INTEGER (1..10),
logicalChannelIdentityExt-r15 INTEGER (32..38)
         logicalChannelConfig-r15
                                                 LogicalChannelConfig
                                                                                   OPTIONAL
                                                                                                   -- Need ON
    }
}
-- ASN1STOP
```

and Intelliging a stin	RadioResourceConfigDedicated field descriptions
	dicates CRS interference mitigation is enabled for the cell, as specified in TS 36.133 [16],
	or UEs in CE supporting ce-CRS-IntfMitig, presence of this field indicates CRS
	nabled in the cell, as specified in TS 36.133 [16], clauses 3.6.1.2 and 3.6.1.3, and the valu
	cates number of PRBs, i.e. 6 or 24 PRBs, for CRS transmission in the central cell BW whe
	n is enabled. For UEs not supporting this feature, the behaviour is undefined if this field is
	llBarred in SystemInformationBlockType1 (SystemInformationBlockType1-BR for BL UEs of
JEs in CE) is set to notbar	red.
crs-PortsCount	
	number of antenna ports for cell-specific reference signal used by the signaled neighboring
	to 1 antenna port, n2 to 2 antenna ports etc. see TS 36.211 [21], clause 6.10.1.
drb-Identity	
	entity is unique within the scope of the UE i.e. an SCG DRB can not use the same value as
	RB. For a split DRB the same identity is used for the MCG- and SCG parts of the
configuration.	
drb-ToAddModList	
	15 is configured, UE shall ignore the <i>drb-ToAddModList</i> (without suffix).
drb-ToAddModListSCG	
	d, E-UTRAN configures at least one SCG or split DRB. When drb-ToAddModListSCG-r15
	pre the drb-ToAddModListSCG (without suffix). When NE-DC is configured, this field
	arers to be (re-)configured.
drb-ToReleaseList	
	15 is configured, UE shall ignore the <i>drb-ToReleaseList</i> (without suffix).
drb-ToReleaseListSCG	
	I, this field indicates the SCG RLC bearers to be released.
drb-Type	
	r the DRB is split or SCG DRB. E-UTRAN does not configure split and SCG DRBs
simultaneously for the UE.	
drb-TypeChange	
Indicates that a split/SCG [	DRB is reconfigured to an MCG DRB (i.e. E-UTRAN only signals the field in case the DRB
type changes).	
drb-TypeLWA	
Indicates whether a DRB is	s (re)configured as an LWA DRB or an LWA DRB is reconfigured not to use WLAN
resources. NOTE 1	
drb-TypeLWIP	
	s (re)configured to use LWIP Tunnel in UL and DL (value <i>lwip</i> ), DL only (value <i>lwip-DL-</i>
only), UL only (value lwip-L	JL-only) or not to use LWIP Tunnel (value eutran).
dummy	
This field is not used in the	specification. If received it shall be ignored by the UE.
logicalChannelConfig	
For SRBs a choice is used	to indicate whether the logical channel configuration is signalled explicitly or set to the
	figuration for SRB1 as specified in 9.2.1.1 or for SRB2 as specified in 9.2.1.2.
logicalChannelldentity, L	ogicalChannelldentityExt
The logical channel identity	v for both UL and DL. Value 4 is not configured for DRBs if SRB4 is configured. When
	is signalled, UE shall ignore contents of <i>logicalChannelIdentity</i> (without suffix).
logicalChannelldentitySC	
	of for both UL and DL. When logicalChannelIdentitySCG-r15 is signalled, UE shall ignore
	IdentitySCG (without suffix).
wa-WLAN-AC	
	s the corresponding WLAN access category for uplink. AC-BK (value ac-bk) corresponds to
	bry, AC-BE (value <i>ac-be</i> ) corresponds to Best Effort access category, AC-VI (value <i>ac-br</i> )
	ss category and AC-VO (value <i>ac-vo</i> ) corresponds to Voice access category as defined by
	wa-WLAN-AC is not configured, it is left up to UE to decide which IEEE 802.11 AC value to
	missions of packets for this DRB over WLAN in the uplink.
wip-DL-Aggregation, Iwi	
	configured to utilize LWIP aggregation in DL or UL.
mac-MainConfig	то дат патра на ак <b>ите и</b> столото от ото
	es a choice that is used to indicate whether the mac-MainConfig is signalled explicitly or se
	onfiguration as specified in 9.2.2, EUTRAN does not apply "defaultValue".
mbsfn-SubframeConfig	
	me configuration used by the signaled neighboring cell. If absent, UE assumes no MBSFN
Defines the MBSFN subfra	
Defines the MBSFN subfra	
	poring cell.
Defines the MBSFN subfra configuration for the neighb measSubframePatternPC	poring cell.

#### RadioResourceConfigDedicated field descriptions neighCellsCRS-Info, neighCellsCRS-InfoSCell, neighCellsCRS-InfoPSCell This field contains assistance information used by the UE to mitigate interference from CRS while performing RRM/RLM/CSI measurement or data demodulation or DL control channel demodulation. When the received CRS assistance information is for a cell with CRS non-colliding with that of the CRS of the cell to measure, the UE may use the CRS assistance information to mitigate CRS interference. When the received CRS assistance information is for a cell with CRS colliding with that of the CRS of the cell to measure, the UE may use the CRS assistance information to mitigate CRS interference RRM/RLM (as specified in TS 36.133 [16]) and for CSI (as specified in TS 36.101 [42]) on the subframes indicated by measSubframePatternPCell, measSubframePatternConfigNeigh, csi-MeasSubframeSet1 if configured, and the CSI subframe set 1 if csi-MeasSubframeSets-r12 is configured. The UE may use CRS assistance information to mitigate CRS interference from the cells in the CRS-AssistanceInfoList for the demodulation purpose or DL control channel demodulation as specified in TS 36.101 [42]. EUTRAN does not configure neighCellsCRS-Info-r11 or neighCellsCRS-Info-r13 if eimta-MainConfigPCell-r12 is configured. neighCellsToAddModList This field contains assistance information used by the UE to cancel and suppress interference of a neighbouring cell. If this field is present for a neighbouring cell, the UE assumes that the transmission parameters listed in the sub-fields are used by the neighbouring cell. If this field is present for a neighbouring cell, the UE assumes the neighbour cell is subframe and SFN synchronized to the serving cell, has the same system bandwidth, UL/DL and special subframe configuration, and cyclic prefix length as the serving cell. p-aList Indicates the restricted subset of power offset for QPSK, 16QAM, and 64QAM PDSCH transmissions for the neighbouring cell by using the parameter P_A, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. p-b Parameter: $P_B$ , indicates the cell-specific ratio used by the signaled neighboring cell, see TS 36.213 [23], Table 5.2-1. pdcp-verChange Indicates that the PDCP version of the SRB is changed from NR PDCP to E-UTRA PDCP. Network only configures this version change for during handover, resume and first reconfiguration after re-establishment. E-UTRAN does not include this field when SRB-ToAddMod is included in srb-ToAddModListSCG. physicalConfigDedicated The default dedicated physical configuration is specified in 9.2.4. resAllocGranularity Indicates the resource allocation and precoding granularity in PRB pair level of the signaled neighboring cell, see TS 36.213 [23], clause 7.1.6. rlc-BearerConfigSecondary The configuration of a secondary RLC bearer within the same Cell Group as may e.g. be used in case of PDCP duplication using CA. The configuration comprises a (secondary) RLC entity, a logical channel identity and a logical channel configuration. E-UTRAN may configure this for SRB1, SRB2 and DRBs. For SRBs, E-UTRAN only configures the field for MCG (i.e. if included in radioResourceConfigDedicated. E-UTRAN configures the same RLC mode (AM/ UM) as used for the original RLC entity. The primary RLC entity is configured by RLC-Config. rlc-Config For SRBs a choice is used to indicate whether the RLC configuration is signalled explicitly or set to the values defined in the default RLC configuration for SRB1 in 9.2.1.1 or for SRB2 in 9.2.1.2. RLC AM is the only applicable RLC mode for SRB1 and SRB2. E-UTRAN does not reconfigure the RLC mode of DRBs except when a full configuration option is used, and may reconfigure the RLC SN field size and the AM RLC LI field size only upon handover within E-UTRA or upon the first reconfiguration after RRC connection re-establishment or upon SCG Change for SCG and split DRBs. servCellp-a Indicates the power offset for QPSK C-RNTI based PDSCH transmissions used by the serving cell, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc. sps-Confia The default SPS configuration is specified in 9.2.3. Except for handover or releasing SPS for MCG, E-UTRAN does not reconfigure sps-Config for MCG when there is a configured downlink assignment or a configured uplink grant for MCG (see TS 36.321 [6]). Except for SCG change or releasing SPS for SCG, E-UTRAN does not reconfigure sps-Config for SCG when there is a configured downlink assignment or a configured uplink grant for SCG (see TS 36.321 [6]). In one serving cell, sps-Config-v1530 is not present simultaneously with either sps-Config (without suffix) or sps-Config-r12. srb-Identity Value 1 is applicable for SRB1 only. Value 2 is applicable for SRB2 only. Value 4 is applicable for SRB4 only, if configured. For a split SRB the same identity is used for the MCG and NR SCG RLC bearer configurations. If srb-Identity-v1530 is received, the UE shall ignore srb-Identity (i.e. without suffix). srb-Identity-v1530 E-UTRAN does not include this field when SRB-ToAddMod is included in srb-ToAddModListSCG. srb-ToAddModListExt The field is to configure SRB4. srb-ToAddModList E-UTRAN configures the same RAT type (i.e. EUTRA or NR) for PDCP configuration of SRB1 and SRB2.

RadioResourceConfigDedicated field descriptions		
transmissionModeList		
Indicates a subset of transmission mode 1, 2, 3, 4, 6, 8, 9, 10, for the signaled neighboring cell for which		
NeighCellsInfo applies. When TM10 is signaled, other signaled transmission parameters in NeighCellsInfo are not		
applicable to up to 8 layer transmission scheme of TM10. E-UTRAN may indicate TM9 when TM10 with QCL type A		
$n^{(i)} = N^{\text{cell}}$		
and DMRS scrambling with $n_{\text{ID}}^{(i)} = N_{\text{ID}}^{\text{cell}}$ in TS 36.211 [21], clause 6.10.3.1, is used in the signalled neighbour cell and		
TM9 or TM10 with QCL type A and DMRS scrambling with $n_{\text{ID}}^{(i)} = N_{\text{ID}}^{\text{cell}}$ in TS 36.211 [21], clause 6.10.3.1, is used in		
The or TW10 With QUE type A and DMRS scrambling with the main 15 36.211 [21], clause 6.10.3.1, is used in		
the serving cell. UE behaviour with NAICS when TM10 is used is only defined when QCL type A and DMRS		
scrambling with $n_{\text{ID}}^{(i)} = N_{\text{ID}}^{\text{cell}}$ in TS 36.211 [21], clause 6.10.3.1, is used for the serving cell and all signalled neighbour		
cells. The first/ leftmost bit is for transmission mode 1, the second bit is for transmission mode 2, and so on.		

NOTE 1: It is up to eNB to ensure that the field indicating LWA bearer type is set to FALSE when LWA bearer is no longer used (e.g. during handover or re-establishment where LWA configuration is released).

Conditional presence	Explanation	
UL-LWA	The field is optionally present, need ON if <i>ul-LWA-Config-r14</i> is present. Otherwise the	
0.000	field is not present.	
CRSIM	The field is optionally present, need ON, if <i>neighCellsCRS-Info-r11</i> is not present; otherwise it is not present.	
DRB-Setup	The field is mandatory present if the corresponding DRB is being set up and the UE is connected to EPC; otherwise it is not present.	
DRB-SetupM	The field is:	
,	<ul> <li>mandatory present upon setup of MCG or split DRB;</li> </ul>	
	<ul> <li>optionally present, Need ON:</li> </ul>	
	<ul> <li>upon change from SCG to MCG DRB;</li> </ul>	
	- for EN-DC:	
	- upon change of <i>keyToUse</i> for a DRB configured with an MCG RLC bearer;	
	<ul> <li>when configured with MCG RLC bearer, upon change of S-K_{gNB} without handover;</li> </ul>	
	- not present otherwise.	
DRB-SetupS	The field is:	
	- mandatory present:	
	<ul> <li>upon setup of SCG or split DRB;</li> </ul>	
	<ul> <li>upon change from MCG to split DRB;</li> </ul>	
	- optionally present, Need ON:	
	- upon change from MCG to SCG DRB;	
	<ul> <li>for NE-DC, upon change of keyToUse for a DRB configured with an SCG RLC bearer;</li> </ul>	
	- not present otherwise.	
HO-Conn	The field is mandatory present in case of handover to E-UTRA or when the <i>fullConfig</i> is	
	included in the <i>RRCConnectionReconfiguration</i> message or in case of RRC connection	
	establishment (excluding RRConnectionResume); otherwise the field is optionally	
	present, need ON. Upon connection establishment/ re-establishment only SRB1 is	
	applicable (excluding RRConnectionResume).	
HO-toEUTRA	The field is mandatory present	
	- in case of handover to E-UTRA or	
	<ul> <li>when the <i>fullConfig</i> is included in the <i>RRCConnectionReconfiguration</i> message with the configuration for at least one MCG bearer or split data bearer;</li> </ul>	
	In case of RRC connection establishment (excluding <i>RRConnectionResume</i> ); and RRC	
	connection re-establishment the field is not present; otherwise the field is optionally	
	present, need ON.	
HO-toEUTRA2	The field is mandatory present in case of handover to E-UTRA or when the fullConfig is	
	included in the RRCConnectionReconfiguration message; otherwise the field is optionally	
	present, need ON.	
LWIP	The field is optionally present, Need ON, if <i>drbTypeLWIP-r13</i> is not set to eutran;	
NR-PDCP	otherwise it is not present and the UE shall delete any existing value for this field. The field is optional present, Need ON, when the SRB is configured with NR-PDCP prior	
NR-FDCF	to reception of this reconfiguration message. Otherwise it is not present.	
PDCP	For the bearers configured with E-UTRA PDCP, the field is mandatory present if the	
	corresponding DRB is being setup; the field is optionally present, need ON, upon	
	reconfiguration of the corresponding split DRB or LWA DRB, upon the corresponding	
	DRB type change from split to MCG bearer, upon the corresponding DRB type change	
	from MCG to split bearer or LWA bearer, upon the corresponding DRB type change from	
	LWA to LTE only bearer, upon handover within E-UTRA and upon the first reconfiguration after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>BECConnectionReconfiguration</i> measures, otherwise it is not present.	
	after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.	
PDCP-S	after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.The field is mandatory present if the corresponding DRB is being setup; the field is	
	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> </ul>	
	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON;</li> </ul>	
RLC-Setup	after re-establishment but in all these cases only when fullConfig is not included in the RRCConnectionReconfiguration message; otherwise it is not present.         The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.         This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.	
PDCP-S RLC-Setup SCellAdd Setup	after re-establishment but in all these cases only when fullConfig is not included in the RRCConnectionReconfiguration message; otherwise it is not present.         The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.         This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.         The field is optionally present, need ON, upon SCG change; otherwise it is not present.         The field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.         The field is optionally present, need ON, upon SCell addition; otherwise it is not present.         The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise	
RLC-Setup SCellAdd Setup	after re-establishment but in all these cases only when fullConfig is not included in the RRCConnectionReconfiguration message; otherwise it is not present.         The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.         This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.         The field is optionally present, need ON, upon SCG laddition; otherwise it is not present.         The field is optionally present, need ON, upon SCell addition; otherwise it is not present.         The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.	
RLC-Setup SCellAdd Setup	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of</li> </ul>	
RLC-Setup SCellAdd Setup SetupM	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present, need ON.</li> </ul>	
RLC-Setup SCellAdd Setup SetupM	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present upon setup of an SCG or split DRB, as well as upon</li> </ul>	
RLC-Setup SCellAdd Setup SetupM SetupS	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split DRB; otherwise the field is optionally present, need ON.</li> </ul>	
RLC-Setup SCellAdd	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split DRB; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split DRB; otherwise the field is optionally present, need ON.</li> </ul>	
RLC-Setup SCellAdd Setup SetupM SetupS	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split DRB; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split or SCG DRB. For an SCG DRB the field is optionally present, need ON.</li> </ul>	
RLC-Setup SCellAdd Setup SetupM SetupS	<ul> <li>after re-establishment but in all these cases only when <i>fullConfig</i> is not included in the <i>RRCConnectionReconfiguration</i> message; otherwise it is not present.</li> <li>The field is mandatory present if the corresponding DRB is being setup; the field is optionally present, need ON, upon SCG change; otherwise it is not present.</li> <li>This field is optionally present if the corresponding DRB is being setup, need ON; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present, need ON, upon SCell addition; otherwise it is not present.</li> <li>The field is optionally present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an MCG or split DRB, or upon setup of MCG RLC bearer; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split DRB; otherwise the field is optionally present, need ON.</li> <li>The field is mandatory present upon setup of an SCG or split DRB, as well as upon change from MCG to split DRB; otherwise the field is optionally present, need ON.</li> </ul>	

Conditional presence	Explanation
SPS2	The field is optionally present, need ON, if sps-Config-r12 is not configured; otherwise it is
	not present.

# **RCLWI-Configuration**

The IE RCLWI-Configuration is used to add, modify or release the RCLWI configuration.

```
-- ASN1START
RCLWI-Configuration-r13 ::=
                                    CHOICE {
   release
                                       NULL,
                                        SEQUENCE {
   setup
       rclwi-Config-r13
                                            RCLWI-Config-r13
}
RCLWI-Config-r13 ::=
                                   SEQUENCE {
                                    CHOICE {
   command
           l
erToWLAN-r13
mobilityConfig-r13
      steerToWLAN-r13
                                         SEQUENCE {
                                                WLAN-Id-List-r12
       },
                                          NULL
       steerToLTE-r13
    },
    . . .
}
-- ASN1STOP
```

RLC-Config

The IE RLC-Config is used to specify the RLC configuration of SRBs and DRBs.

# **RLC-Config** information element

```
-- ASN1START
                          CHOICE {
RLC-Config ::=
                                      SEQUENCE {
   am
                                          UL-AM-RLC,
       ul-AM-RLC
       dl-AM-RLC
                                          DL-AM-RLC
   },
   um-Bi-Directional
                                      SEQUENCE {
       ul-UM-RLC
                                         UL-UM-RLC,
       dl-UM-RLC
                                          DL-UM-RLC
   },
   um-Uni-Directional-UL
                                     SEQUENCE {
       ul-UM-RLC
                                       UL-UM-RLC
   },
   um-Uni-Directional-DL
                                      SEQUENCE {
       dl-UM-RLC
                                          DL-UM-RLC
   },
   . . .
}
RLC-Config-v1250 ::=
                                  SEQUENCE {
   ul-extended-RLC-LI-Field-r12
                                         BOOLEAN,
   dl-extended-RLC-LI-Field-r12
                                          BOOLEAN
}
RLC-Config-v1310 ::=
                                  SEQUENCE {
   ul-extended-RLC-AM-SN-r13
                                              BOOLEAN,
   dl-extended-RLC-AM-SN-r13
                                              BOOLEAN,
                                                                OPTIONAL -- Need OR
                                              PollPDU-v1310
   pollPDU-v1310
}
RLC-Config-v1430 ::=
                                  CHOICE {
                                     NULT
   release
                                      SEQUENCE {
   setup
       pollByte-r14
                                         PollByte-r14
   1
}
```

```
RLC-Config-v1510 ::=
   -Config-v1510 ::= SEQUENCE {
reestablishRLC-r15 ENUMERATED {true}
}
                                  CHOICE {
RLC-Config-v1530 ::=
                                     NULL,
   release
                                      SEQUENCE {
    setup
      rlc-OutOfOrderDelivery-r15
                                        ENUMERATED {true}
}
RLC-Config-r15 ::= SEQUENCE {
   mode-r15
                                           CHOICE {
       am-r15
                                           SEQUENCE {
                                            UL-AM-RLC-r15,
         ul-AM-RLC-r15
           dl-AM-RLC-r15
                                              DL-AM-RLC-r15
        },
       um-Bi-Directional-r15
                                         SEQUENCE {
         ul-UM-RLC-r15
                                               UL-UM-RLC,
           dl-UM-RLC-r15
                                               DL-UM-RLC-r15
        },
        um-Uni-Directional-UL-r15 SEQUENCE {
         ul-UM-RLC-r15
                                              UL-UM-RLC
        },
        dl-UM-RLC-r15
                                             DL-UM-RLC-r15
        }
   },
   reestablishRLC-r15 ENUMERATED {true} OPTIONAL,
rlc-OutOfOrderDelivery-r15 ENUMERATED {true} OPTIONAL,
                                                                                  -- Need ON
                                                                                  -- Need ON
    . . .
}
UL-AM-RLC ::=
                                  SEQUENCE {
   t-PollRetransmit
                                   T-PollRetransmit,
   pollPDU
                                      PollPDU,
   pollByte
                                      PollByte,
   maxRetxThreshold
                                      ENUMERATED {
                                          t1, t2, t3, t4, t6, t8, t16, t32}
}
   AM-RLC-r15 ::= SEQUENCE {
t-PollRetransmit-r15 T-PollRetransmit,
pollPDU-r15 PollPDU-r15,
UL-AM-RLC-r15 ::=
   pollByte-r15
                                       PollByte-r14,
   maxRetxThreshold-r15
                                      ENUMERATED {
                                        t1, t2, t3, t4, t6, t8, t16, t32},
    extended-RLC-LI-Field-r15 BOOLEAN
}
DL-AM-RLC ::=
                                  SEQUENCE {
   AM-RLC ::=
t-Reordering
t-StatusProhibit
                                   T-Reordering,
  t-Reordering
                                      T-StatusProhibit
}
  t-Reordering-r15
t-StatusProhibit-r15
extended-PLO training
DL-AM-RLC-r15 ::=
                                  SEQUENCE {
                                  T-Reordering,
T-StatusProhibit,
   extended-RLC-LI-Field-r15
                                     BOOLEAN
}
UL-UM-RLC ::=
                                  SEQUENCE {
                                      SN-FieldLength
   sn-FieldLength
}
DL-UM-RLC ::=
                                   SEQUENCE {
                                    SN-FieldLength,
  sn-FieldLength
                                      T-Reordering
   t-Reordering
}
DL-UM-RLC-r15 ::=
                                  SEQUENCE {
  -UM-RLC-r15 ::=
sn-FieldLength-r15
                                   SN-FieldLength-r15,
   t-Reordering-r15
                                      T-Reordering
}
SN-FieldLength ::=
                                  ENUMERATED {size5, size10}
```

SN-FieldLength-r15 ::=	ENUMERATED {size5, size10, size16-r15}
T-PollRetransmit ::=	<pre>ENUMERATED {     ms5, ms10, ms15, ms20, ms25, ms30, ms35,     ms40, ms45, ms50, ms55, ms60, ms65, ms70,     ms75, ms80, ms85, ms90, ms95, ms100, ms105,     ms110, ms115, ms120, ms125, ms130, ms135,     ms140, ms145, ms150, ms155, ms160, ms165,     ms170, ms175, ms180, ms185, ms190, ms195,     ms200, ms205, ms210, ms215, ms220, ms225,     ms230, ms235, ms240, ms245, ms250, ms300,     ms350, ms400, ms450, ms500, ms800-v1310,     ms1000-v1310, ms2000-v1310, ms4000-v1310,     spare5, spare4, spare3, spare2, spare1}</pre>
PollPDU ::=	ENUMERATED { p4, p8, p16, p32, p64, p128, p256, pInfinity}
PollPDU-v1310 ::=	ENUMERATED { p512, p1024, p2048, p4096, p6144, p8192, p12288, p16384}
PollPDU-r15 ::=	ENUMERATED { p4, p8, p16, p32, p64, p128, p256, p512, p1024, p2048-r15, p4096-r15, p6144-r15, p8192-r15, p12288-r15, p16384-r15, pInfinity}
PollByte ::=	ENUMERATED { kB25, kB50, kB75, kB100, kB125, kB250, kB375, kB500, kB750, kB1000, kB1250, kB1500, kB2000, kB3000, kBinfinity, spare1}
PollByte-r14 ::=	ENUMERATED { kB1, kB2, kB5, kB8, kB10, kB15, kB3500, kB4000, kB4500, kB5000, kB5500, kB6500, kB7000, kB7500, kB8000, kB9000, kB10000, kB11000, kB12000, kB13000, kB14000, kB15000, kB16000, kB17000, kB18000, kB19000, kB20000, kB25000, kB30000, kB35000, kB40000}
T-Reordering ::=	ENUMERATED { ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35, ms40, ms45, ms50, ms55, ms60, ms65, ms70, ms75, ms80, ms85, ms90, ms95, ms100, ms110, ms120, ms130, ms140, ms150, ms160, ms170, ms180, ms190, ms200, ms1600-v1310}
T-StatusProhibit ::=	<pre>ENUMERATED {     ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,     ms40, ms45, ms50, ms55, ms60, ms65, ms70,     ms75, ms80, ms85, ms90, ms95, ms100, ms105,     ms110, ms115, ms120, ms125, ms130, ms135,     ms140, ms145, ms150, ms155, ms160, ms165,     ms170, ms175, ms180, ms185, ms190, ms195,     ms200, ms205, ms210, ms215, ms220, ms225,     ms230, ms235, ms240, ms450, ms500, ms800,     ms350, ms400, ms450, ms500, ms800-v1310,     ms1000-v1310, ms1200-v1310, ms1200-v1310,</pre>
ms2400-v1310, spare2,	<pre>spare1}</pre>
ASN1STOP	

RLC-Config field descriptions
dl-extended-RLC-LI-Field, ul-extended-RLC-LI-Field
Indicates the RLC LI field size. Value TRUE means that 15 bit LI length shall be used, otherwise 11 bit LI length sha
be used; see TS 36.322 [7]. E-UTRAN enables this field only when <i>RLC-Config</i> (without suffix) is set to am.
maxRetxThreshold
Parameter for RLC AM in TS 36.322 [7]. Value t1 corresponds to 1 retransmission, t2 to 2 retransmissions and so of
reestablishRLC
Indicates that RLC shall be re-established. For a UE configured with (NG)EN-DC, E-UTRAN may sets include this
field for the (primary) RLC entity of an MCG RLC bearer of a DRB (used upon change from SN terminated split to M
terminated MCG RLC bearer). For a UE configured with NE-DC, E-UTRAN may include this field for the (primary) R
entity of an SCG RLC bearer of a DRB or of an SRB (used upon key refresh for MN terminated split RB).
pollByte
Parameter for RLC AM in TS 36.322 [7]. Value kB25 corresponds to 25 kBytes, kB50 to 50 kBytes and so on.
kBInfinity corresponds to an infinite amount of kBytes. In case <i>pollByte-r14</i> is signalled, the UE shall ignore pollByte
(i.e. without suffix).
pollPDU
Parameter for RLC AM in TS 36.322 [7]. Value p4 corresponds to 4 PDUs, p8 to 8 PDUs and so on. pInfinity
corresponds to an infinite number of PDUs. In case pollPDU-r13 is signalled, the UE shall ignore pollPDU (i.e. witho
suffix). E-UTRAN enables pollPDU-v1310 field only when RLC-Config (without suffix) is set to am.
rlc-OutOfOrderDelivery
Indicates that out-of-order delivery from RLC to PDCP is configured for this RLC entity as specified in TS 36.322 [7].
sn-FieldLength
Indicates the UM RLC SN field size, see TS 36.322 [7], in bits. Value size5 means 5 bits, size10 means 10 bits.
t-PollRetransmit
Timer for RLC AM in TS 36.322 [7], in milliseconds. Value ms5 means 5ms, ms10 means 10ms and so on. EUTRAM
configures values msX-v1310 (with suffix) only if UE supports CE.
t-Reordering
Timer for reordering in TS 36.322 [7], in milliseconds. Value ms0 means 0ms and behaviour as specified in 7.3.2
applies, ms5 means 5ms and so on.
t-StatusProhibit
Timer for status reporting in TS 36.322 [7], in milliseconds. Value ms0 means 0ms and behaviour as specified in 7.3
applies, ms5 means 5ms and so on. EUTRAN configures values msX-v1310 (with suffix) only if UE supports operati
in CE.
ul-extended-RLC-AM-SN, dl-extended-RLC-AM-SN
Indicates whether or not the UE shall use the exteneded SN and SO length for AM bearer. Value TRUE means that
bit SN length and 16 bit SO length shall be used, otherwise 10 bit SN length and 15 bit SO length shall be used; see

Indicates whether or not the UE shall use the extended SN and SO length for AM bearer. Value *TRUE* means that 16 bit SN length and 16 bit SO length shall be used, otherwise 10 bit SN length and 15 bit SO length shall be used; see TS 36.322 [7].

#### _

# RLF-TimersAndConstants

The IE *RLF-TimersAndConstants* contains UE specific timers and constants applicable for UEs in RRC_CONNECTED.

# RLF-TimersAndConstants information element

ASN1START	
RLF-TimersAndConstants-r9 ::=	CHOICE {
release	NULL,
setup	SEQUENCE {
t301-r9	ENUMERATED {
	ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,
	ms2000},
t310-r9	ENUMERATED {
	ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},
n310-r9	ENUMERATED {
	n1, n2, n3, n4, n6, n8, n10, n20},
t311-r9	ENUMERATED {
	ms1000, ms3000, ms5000, ms10000, ms15000,
	ms20000, ms30000},
n311-r9	ENUMERATED {
	n1, n2, n3, n4, n5, n6, n8, n10},
}	
}	
RLF-TimersAndConstants-r13 ::=	CHOICE {
release	NULL,
setup	SEQUENCE {

```
t301-v1310
                                                ENUMERATED {
                                                    ms2500, ms3000, ms3500, ms4000, ms5000,
                                                    ms6000, ms8000, ms10000},
        [[ t310-v1330
                                                ENUMERATED {ms4000, ms6000} OPTIONAL
                                                                                        -- Need ON
        ]]
    }
}
RLF-TimersAndConstantsSCG-r12 ::=
                                            CHOICE {
   release
                                      NULL,
                                        SEQUENCE {
    setup
        t313-r12
                                            ENUMERATED
                                               ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},
       n313-r12
                                            ENUMERATED {
                                             n1, n2, n3, n4, n6, n8, n10, n20},
       n314-r12
                                            ENUMERATED {
                                                n1, n2, n3, n4, n5, n6, n8, n10},
        . . .
    }
}
-- ASN1STOP
```

#### RLF-TimersAndConstants field descriptions

n3xy
 Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on.
 t3xy
 Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms50 corresponds with 50 ms and so on.
 E-UTRAN configures *RLF-TimersAndConstants-r13* only if UE supports *ce-ModeB*. UE shall use the extended values
 t3xy-v1310 and t3xy-v1330, if present, and ignore the values signaled by t3xy-r9.

# RN-SubframeConfig

The IE RN-SubframeConfig is used to specify the subframe configuration for an RN.

# RN-SubframeConfig information element

```
-- ASN1START
RN-SubframeConfig-r10 ::=
    SubframeConfig-r10 ::= SEQUENCE {
subframeConfigPattern-r10 CHOICE {
subframeConfigPatternFDD-r10 BIT STRING (SIZE(8)),
        subframeConfigPatternTDD-r10 INTEGER (0..31)
                                                                            OPTIONAL,
                                                                                         -- Need ON
    rpdcch-Config-r10
                                     SEQUENCE {
        resourceAllocationType-r10
                                       ENUMERATED {type0, type1, type2Localized, type2Distributed,
                                                       spare4, spare3, spare2, spare1},
                                              CHOICE {
        resourceBlockAssignment-r10
            type01-r10
                                                  CHOICE {
                nrb6-r10
                                                      BIT STRING (SIZE(6)),
                nrb15-r10
                                                       BIT STRING (SIZE(8)),
                nrb25-r10
                                                      BIT STRING (SIZE(13)),
                nrb50-r10
                                                      BIT STRING (SIZE(17)),
                nrb75-r10
                                                       BIT STRING (SIZE(19)),
                nrb100-r10
                                                      BIT STRING (SIZE(25))
            },
             type2-r10
                                                   CHOICE {
                nrb6-r10
                                                      BIT STRING (SIZE(5)),
                                                       BIT STRING (SIZE(7)),
                nrb15-r10
                nrb25-r10
                                                      BIT STRING (SIZE(9)),
                nrb50-r10
                                                      BIT STRING (SIZE(11)),
                nrb75-r10
                                                       BIT STRING (SIZE(12)),
                nrb100-r10
                                                      BIT STRING (SIZE(13))
            },
             . . .
        },
        demodulationRS-r10
                                          CHOICE {
            interleaving-r10
                                              ENUMERATED {crs},
            noInterleaving-r10
                                              ENUMERATED {crs, dmrs}
        }
        pdsch-Start-r10
                                          INTEGER (1..3),
        pucch-Config-r10
                                          CHOICE {
```

	tdd	(	CHOICE {	
		channelSelectionMultiplexing	Bundling SEQUENCE {	
		nlPUCCH-AN-List-r10	SEQUENCE (SIZE (14)) C	OF INTEGER (02047)
		},		
		fallbackForFormat3	SEQUENCE {	
		nlPUCCH-AN-P0-r10	INTEGER (02047),	
		n1PUCCH-AN-P1-r10	INTEGER (02047)	OPTIONAL Need OR
		}		
	},		,	
	fdd		SEQUENCE {	
		n1PUCCH-AN-P0-r10	INTEGER (02047),	
		n1PUCCH-AN-P1-r10	INTEGER (02047)	OPTIONAL Need OR
,	}			
},				
,				
}				OPTIONAL, Need ON
}				
ASN1STOP				

# RN-SubframeConfig field descriptions

demodulationRS	
Indicates which reference signals are used for R-PDCCH demodulation according to TS 36.216 [55], clause 7.4	
Value interleaving corresponds to cross-interleaving and value noInterleaving corresponds to no cross-interleav	/ing
according to TS 36.216 [55], clauses 7.4.2 and 7.4.3.	
n1PUCCH-AN-List	
n ⁽¹⁾	
Parameter: $n_{\text{PUCCH},t}^{(1)}$ , see TS 36.216, [55], clause 7.5.1. This parameter is only applicable for TDD. Configures	
PUCCH HARQ-ACK resources if the RN is configured to use HARQ-ACK channel selection, HARQ-ACK multip	olexino
or HARQ-ACK bundling.	
n1PUCCH-AN-P0, n1PUCCH-AN-P1	
Parameter: $n_{\text{PLICCH}}^{(1,p)}$ , for antenna port P0 and for antenna port P1 respectively, see TS 36.216, [55], clause 7.5	5.1. foi
recen	,
FDD and [55], clause 7.5.2 for TDD. pdsch-Start	
Parameter: DL-StartSymbol, see TS 36.216 [55], Table 5.4-1.	
resourceAllocationType	
Represents the resource allocation used: type 0, type 1 or type 2 according to TS 36.213 [23], clause 7.1.6. Val	luo
type0 corresponds to type 0, value type1 corresponds to type 1, value type2 Localized corresponds to type 2 wit	
localized virtual resource blocks and type2Distributed corresponds to type 2 with distributed virtual resource blo	
resourceBlockAssignment	JUNS.
Indicates the resource block assignment bits according to TS 36.213 [23], clause 7.1.6. Value type01 correspon	ada ta
type 0 and type 1, and the value type2 corresponds to type 2. Value nrb6 corresponds to a downlink system	
bandwidth of 6 resource blocks, value nrb15 corresponds to a downlink system bandwidth of 15 reso	ource
blocks, and so on.	
subframeConfigPatternFDD	
Parameter: SubframeConfigurationFDD, see TS 36.216 [55], Table 5.2-1. Defines the DL subframe configuration	
eNB-to-RN transmission, i.e. those subframes in which the eNB may indicate downlink assignments for the RN.	
radio frame in which the pattern starts (i.e. the radio frame in which the first bit of the subframeConfigPatternFD	D
corresponds to subframe #0) occurs when SFN mod 4 = 0.	
subframeConfigPatternTDD	
Parameter: SubframeConfigurationTDD, see TS 36.216 [55], Table 5.2-2. Defines the DL and UL subframe	
configuration for eNB-RN transmission.	

—

# RSS-Config

The IE RSS-Config is used to specify the RSS configuration, see TS 36.211 [21].

# **RSS-Config** information element

-- ASN1START

RSS-Config-r15 ::= duration-r15 freqLocation-r15 periodicity-r15 powerBoost-r15 SEQUENCE {
 ENUMERATED {sf8, sf16, sf32, sf40},
 INTEGER (0..98),
 ENUMERATED {ms160, ms320, ms640, ms1280},
 ENUMERATED {dB0, dB3, dB4dot8, dB6},

INTEGER (0..31)

```
timeOffset-r15
```

}

```
-- ASN1STOP
```

#### RSS-Config field descriptions

duration

Duration of RSS in subframes. Value sf8 corresponds to 8 subframes, value sf16 corresponds to 16 subframes and so on.

freqLocation

Frequency location (lowest PRB number) of RSS.

periodicity

Periodicity of RSS. Value ms160 corresponds to 160 ms, value ms320 corresponds to 320 ms and so on.

powerBoost

Power offset of RSS relative to CRS in dB. Value dB0 corresponds to 0 dB, value dB3 corresponds to 3 dB, value dB4dot8 corresponds to 4.8 dB and so on.

#### timeOffset

Time offset of RSS in frames. The actual value of time offset is based on the value of *periodicity*, as follows: For *periodicity* 160 ms, only value range 0 to 15 are applicable. Actual value = *timeOffset* * 1 frame. For *periodicity* 320 ms, actual value = *timeOffset* * 1 frame. For *periodicity* 640 ms, actual value = *timeOffset* * 2 frames. For *periodicity* 1280 ms, actual value = *timeOffset* * 4 frames.

# SchedulingRequestConfig

The IE SchedulingRequestConfig is used to specify the Scheduling Request related parameters

# SchedulingRequestConfig information element

```
-- ASN1START
SchedulingRequestConfig ::=
                                CHOICE {
    release
                                        NULL,
    setup
                                        SEQUENCE {
        sr-PUCCH-ResourceIndex
                                            INTEGER (0..2047),
                                            INTEGER (0..157),
        sr-ConfigIndex
        dsr-TransMax
                                            ENUMERATED {
                                                n4, n8, n16, n32, n64, spare3, spare2, spare1}
    }
}
SchedulingRequestConfig-v1020 ::= SEQUENCE {
    sr-PUCCH-ResourceIndexP1-r10
                                                                    OPTIONAL
                                        INTEGER (0..2047)
                                                                                     -- Need OR
}
                                            CHOICE {
SchedulingRequestConfigSCell-r13 ::=
   release
                                      NULL,
                                        SEQUENCE {
    setup
        sr-PUCCH-ResourceIndex-r13
                                            INTEGER (0..2047),
        sr-PUCCH-ResourceIndexP1-r13
                                            INTEGER (0..2047)
                                                                         OPTIONAL,
                                                                                         -- Need OR
        sr-ConfigIndex-r13
                                            INTEGER (0..157),
       dsr-TransMax-r13
                                            ENUMERATED {
                                                n4, n8, n16, n32, n64, spare3, spare2, spare1}
    }
}
SchedulingRequestConfig-v1530 ::= CHOICE {
    release
                                        NULL
                                        SEQUENCE {
    setup
        sr-SlotSPUCCH-IndexFH-r15 INTEGER (0..1319) OPTIONAL, -- Need
sr-SlotSPUCCH-IndexNoFH-r15 INTEGER (0..3959) OPTIONAL, -- Need OR
                                                                    OPTIONAL, -- Need OR
        sr-SubslotSPUCCH-ResourceList-r15 SR-SubslotSPUCCH-ResourceList-r15 OPTIONAL, -- Need OR
                                            INTEGER (0..36)
                                                                                -- Need OR
                                                                    OPTIONAL,
        sr-ConfigIndexSlot-r15
                                            INTEGER (0..122)
        sr-ConfigIndexSubslot-r15
                                                                                     -- Need OR
                                                                    OPTIONAL,
                                            ENUMERATED {
        dssr-TransMax-r15
                                                n4, n8, n16, n32, n64, spare3, spare2, spare1}
    }
}
SR-SubslotSPUCCH-ResourceList-r15 ::= SEQUENCE (SIZE(1..4)) OF INTEGER (0..1319)
```

#### -- ASN1STOP

#### SchedulingRequestConfig field descriptions

*dsr-TransMax* Parameter for SR transmission in TS 36.321 [6], clause 5.4.4. The value n4 corresponds to 4 transmissions, n8 corresponds to 8 transmissions and so on. EUTRAN configures the same value for all serving cells for which this field is configured.

# dssr-TransMax

Parameter for SPUCCH SR transmission in TS 36.321 [6], clause 5.4.4. EUTRAN configures the same value for all serving cells for which this field is configured.

#### sr-ConfigIndex, sr-ConfigIndexSlot, sr-ConfigIndexSubslot

Parameter I_{SR}. See TS 36.213 [23], clause 10.1. The values 156 and 157 are not applicable for Release 8.

# sr-PUCCH-ResourceIndex, sr-PUCCH-ResourceIndexP1

Parameter:  $n_{PUCCH,SRI}^{(1,p)}$  for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. E-UTRAN configures *sr-PUCCH-ResourceIndexP1* only if *sr-PUCCHResourceIndex* is configured.

#### sr-SlotSPUCCH-IndexFH

Resource configuration for SR using slot-SPUCCH when frequency hopping is enabled, see TS 36.213 [23], clause 10.1.5.

#### sr-SlotSPUCCH-IndexNoFH

Resource configuration for SR using slot-SPUCCH when frequency hopping is disabled, see TS 36.213 [23], clause 10.1.5.

#### sr-SubslotSPUCCH-ResourceList

Resource configuration for SR using subslot-SPUCCH, see TS 36.213 [23], clause 10.1.5.

# – SlotOrSubslotPDSCH-Config

The IE SlotOrSubslotPDSCH-Config is used to specify the UE specific PDSCH configuration when sTTI is used.

# SlotOrSubslotPDSCH-Config information element

```
-- ASN1START
SlotOrSubslotPDSCH-Config-r15 ::= CHOICE {
                                  NULL.
   release
                                  SEQUENCE {
   setup
                                   ENUMERATED {
       altCQI-TableSTTI-r15
                                          allSubframes, csi-SubframeSet1,
                                          csi-SubframeSet2, spare1}
                                                                            OPTIONAL, -- Need OR
       altCQI-Table1024QAM-STTI-r15 ENUMERATED {
                                         allSubframes, csi-SubframeSet1,
                                          csi-SubframeSet2, spare1}
                                                                           OPTIONAL, -- Need OR
       resourceAllocation-r15 ENUMERATED {
                          resourceAllocationType0, resourceAllocationType2}
                                                                           OPTIONAL, -- Need OR
       tbsIndexAlt-STTI-r15
                              ENUMERATED {a33} OPTIONAL, -- Need OR
                                                                 OPTIONAL, -- Need OR
OPTIONAL, -- Need OR
        tbsIndexAlt2-STTI-r15
                                      ENUMERATED {b33}
                                     ENUMERATED {a37}
       tbsIndexAlt3-STTI-r15
   }
```

-- ASN1STOP

SlotOrSubslotPDSCH-Config field descriptions
altCQI-TableSTTI, altCQI-Table1024QAM-STTI
Indicates the applicability of the alternative CQI table (i.e. Table 7.2.3-2 and Table 7.2.3-4 in TS 36.213 [23]) for
aperiodic CSI reporting for slot or subslot PDSCH for the concerned serving cell. Value allSubframes means the
alternative CQI table applies to all the subframes and CSI processes, if configured, and value csi-SubframeSet1
means the alternative CQI table applies to CSI subframe set1, and value csi-SubframeSet2 means the alternative CQI
table applies to CSI subframe set2. EUTRAN sets the value to csi-SubframeSet1 or csi-SubframeSet2 only if
transmissionMode is set in range <i>tm1</i> to <i>tm9</i> and csi-SubframePatternConfig-r10 is configured for the concerned
serving cell and different CQI tables apply to the two CSI subframe sets; otherwise EUTRAN sets the value to
allSubframes. EUTRAN does not configure the same value for altCQI-TableSTTI-r15 and altCQI-Table-1024QAM-
STTI-r15 in SlotOrSubslotPDSCH-Config-r15. EUTRAN does not configure altCQI-Table-1024QAM-STTI-r15 if the
value of altCQI-TableSTTI-r15 is set to allSubframes. EUTRAN does not configure altCQI-TableSTTI-r15 if the value
of altCQI-Table-1024QAM-STTI-r15 is set to allSubframes. If both altCQI-TableSTTI-r15 and altCQI-Table-1024QAM-
STTI-r15 are absent, the UE shall use Table 7.2.3-1 in TS 36.213 [23] for all subframes and CSI processes, if
configured.
resourceAllocation
Parameter indicates resource allocation type for slot-PDSCH or subslot-PDSCH.
tbsIndexAlt-STTI
Indicates the applicability of the alternative TBS index for the $h_{\text{TBS}}$ 33 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all
slots/subslots scheduled by DCI format 7-1F and 7-1G. Value a 33 refers to the alternative TBS index Index ArBs 33A. If
neither this field nor tbsIndexAlt2-STTI configures an alternative TBS index for ITBS 33, the UE shall use ITBS 33
specified in Table 7.1.7.2.1-1 in TS 36.213 [23] for all slots/subslots instead.
tbsIndexAlt2-STTI
Indicates the applicability of the alternative TBS index for the $h_{\text{TBS}}$ 33 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all
slots/subslots scheduled by DCI format 7-1B/7-1C/7-1D. Value b33 refers to the alternative TBS index /rвs 33B. If
neither this field nor tbsIndexAlt-STTI configures an alternative TBS index for has 33, the UE shall use has 33 specified
in Table 7.1.7.2.1-1 in TS 36.213 [23] for all slots/subslots instead.
tbsIndexAlt3-STTI
Indicates the applicability of the alternative TBS index for the $h_{\text{TBS}}$ 37 (see TS 36.213 [23], Table 7.1.7.2.1-1) to all
slots/subslots scheduled by DCI format 7-1F/7-1G. Value a37 refers to the alternative TBS index IrBs 37A. If this field
does not configure an alternative TBS index for $h_{\text{BS}}$ 37, the UE shall use $h_{\text{BS}}$ 37 specified in TS 36.213 [23], Table 7.1.7.2.1-1 for all slots/subslots instead.

# SlotOrSubslotPUSCH-Config

The IE SlotOrSubslotPUSCH-Config is used to specify the UE specific PUSCH configuration when sTTI is used.

# SlotOrSubslotPUSCH-Config information element

ASN1START			
SlotOrSubslotPUSCH	-Config-r15 ::= CHOICE {		
release	NULL,		
setup	SEQUENC	· ·	
	Slot-ACK-Index-r15	, ,	OPTIONAL, Need OR
	2Slot-ACK-Index-r15	, ,	OPTIONAL, Need OR
betaOffset	Subslot-ACK-Index-r15	SEQUENCE (SIZE(12	2)) OF INTEGER(015) OPTIONAL,
Need OR			
betaOffset	2Subslot-ACK-Index-r15	SEQUENCE (SIZE(12	2)) OF INTEGER(015) OPTIONAL,
Need OR			
betaOffset	Slot-RI-Index-r15	INTEGER(015)	OPTIONAL, Need OR
betaOffset	Subslot-RI-Index-r15	SEQUENCE (SIZE(12	2)) OF INTEGER(015) OPTIONAL,
Need OR			
betaOffset	Slot-CQI-Index-r15	INTEGER(015)	OPTIONAL, Need OR
betaOffset	Subslot-CQI-Index-r15	INTEGER(015)	OPTIONAL, Need OR
~	AM-SlotOrSubslot-r15	Enable256QAM-r14	OPTIONAL, Need ON
resourceAl	locationOffset-r15	INTEGER (12)	OPTIONAL, Need OR
ul-DMRS-IF	DMA-SlotOrSubslot-r15	BOOLEAN,	
}			
}			

-- ASN1STOP

SlotOrSubslotPUSCH-Config field descriptions	
betaOffsetSlot-ACK-Index, betaOffsetSubslot-ACK-Index, betaOffset2Slot-ACK-Ind ACK-Index	ex, betaOffset2Subslot-
Parameter: $I_{offset}^{HARQ-ACK}$ and $I_{offset,X}^{HARQ-ACK}$ for single-codeword, see TS 36.213 [23], Table 3	8.6.3-1. If betaOffset2Slot-
ACK-Index/betaOffset2Subslot-ACK-Index is configured; betaOffsetSlot-ACK-Index/beta used when up to 22 HARQ-ACK bits are transmitted otherwise betaOffset2Slot-ACK-Index Index is used. The values apply for all serving cells with an uplink in a cell group (MCG or configured to send SPUCCH on the same cell in case SPUCCH SCell is configured) and power control subframe sets. It is indicated in DCI format 7-0A/7-0B which of the two valu betaOffsetSubslot-ACK-Index-r15/betaOffset2Subslot-ACK-Index-r15/ betaOffsetSubslot same value also applies for subframe set 1 of all serving cells with an uplink in that cell g uplink power control subframe sets (the associated functionality is common i.e. not perfor cell).	ex/betaOffset2Subslot-ACK- r SCG or the group of cells not configured with uplink ues taken by - <i>RI-Index-r15</i> to use. The roup and configured with
betaOffsetSlot-RI-Index, betaOffsetSubslot-RI-Index	
Parameter: $I_{affset}^{RI}$ , for single codeword, see TS 36.213 [23], Table 8.6.3-2. One value ap	plies for subframe set 2 of all
serving cells with an uplink in a cell group (MCG or SCG or the group of cells configured same cell in case SPUCCH SCell is configured) and configured with uplink power control associated functionality is common i.e. not performed independently for each cell configured subframe sets).	to send SPUCCH on the subframe sets (the
betaOffsetSlot-CQI-Index, betaOffsetSubslot-CQI-Index	
Parameter: $I_{\it offset}^{CQI}$ , for single codeword, see TS 36.213 [23], Table 8.6.3-3. One value ap	plies for all serving cells with
an uplink in a cell group (MCG or SCG or the group of cells configured to send SPUCCH SPUCCH SCell is configured) and not configured with uplink power control subframe sets applies for subframe set 1 of all serving cells with an uplink in that cell group and configure subframe sets (the associated functionality is common i.e. not performed independently f	on the same cell in case s. The same value also red with uplink power control
enable256QAM-SlotOrSubslot	
Indicates that 256QAM for slot or subslot is enabled, see TS 36.213 [23], clause 8.6.1.	
<b>resourceAllocationOffset</b> Indicates an RB resource allocation offset of 1 or 2 PRBs for slot-PUSCH or subslot-PUS the UE assumes no offset is used (i.e. offset = 0).	CH. When the field is absent
ul-DMRS-IFDMA-SlotOrSubslot	
Value TRUE indicates that the UE is configured with enhanced UL DMRS.	

# SoundingRS-UL-Config

í

The IE *SoundingRS-UL-Config* is used to specify the uplink Sounding RS configuration for periodic and aperiodic sounding.

# SoundingRS-UL-Config information element

ASN1START	
SoundingRS-UL-ConfigCommon ::=	CHOICE {
release	NULL,
setup	SEQUENCE {
srs-BandwidthConfig	ENUMERATED {bw0, bw1, bw2, bw3, bw4, bw5, bw6, bw7},
srs-SubframeConfig	ENUMERATED {
	sc0, sc1, sc2, sc3, sc4, sc5, sc6, sc7,
	sc8, sc9, sc10, sc11, sc12, sc13, sc14, sc15},
ackNackSRS-SimultaneousTrans	smission BOOLEAN,
srs-MaxUpPts	ENUMERATED {true} OPTIONAL Cond TDD
}	
}	
SoundingRS-UL-ConfigDedicated ::=	CHOICE {
release	NULL,
setup	SEQUENCE {
srs-Bandwidth	ENUMERATED {bw0, bw1, bw2, bw3},
srs-HoppingBandwidth	ENUMERATED {hbw0, hbw1, hbw2, hbw3},
freqDomainPosition	INTEGER (023),
duration	BOOLEAN,
srs-ConfigIndex	INTEGER (01023),
transmissionComb	INTEGER (01),
cyclicShift	ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}
}	
}	

```
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```

```
SoundingRS-UL-ConfigDedicated-v1020 ::= SEQUENCE {
    srs-AntennaPort-r10
                                        SRS-AntennaPort
}
SoundingRS-UL-ConfigDedicated-v1310 ::= CHOICE{
   release
                                        NULL
    setup
                                         SEQUENCE {
                                             INTEGER (2..3)
        transmissionComb-v1310
                                                                         OPTIONAL,
                                                                                     -- Need OR
        cyclicShift-v1310
                                             ENUMERATED {cs8, cs9, cs10, cs11}
                                                                                 OPTIONAL,
                                                                                             -- Need
OR
        transmissionCombNum-r13
                                            ENUMERATED {n2, n4}
                                                                     OPTIONAL
                                                                                  -- Need OR
    }
}
SoundingRS-UL-ConfigDedicatedUpPTsExt-r13 ::=
                                                CHOICE {
   release
                                        NULT.
    setup
                                         SEQUENCE {
        srs-UpPtsAdd-r13
                                                 ENUMERATED {sym2, sym4},
        srs-Bandwidth-r13
                                             ENUMERATED {bw0, bw1, bw2, bw3},
                                             ENUMERATED {hbw0, hbw1, hbw2, hbw3},
        srs-HoppingBandwidth-r13
                                             INTEGER (0..23),
        freqDomainPosition-r13
        duration-r13
                                            BOOLEAN,
        srs-ConfigIndex-r13
                                             INTEGER (0..1023),
        transmissionComb-r13
                                            INTEGER (0..3),
        cyclicShift-r13
                                            ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7,
                                                         cs8, cs9, cs10, cs11},
        srs-AntennaPort-r13
                                            SRS-AntennaPort,
        transmissionCombNum-r13
                                            ENUMERATED {n2, n4}
    }
}
SoundingRS-UL-ConfigDedicatedAperiodic-r10 ::= CHOICE{
    release
                                        NULL.
                                        SEQUENCE {
    setup
        srs-ConfigIndexAp-r10
                                             INTEGER (0..31),
        srs-ConfigApDCI-Format4-r10
                                             SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r10 OPTIONAL, --
Need ON
                                             CHOICE {
        srs-ActivateAp-r10
                release
                                                NULL,
                                                 SEQUENCE {
                setup
                    srs-ConfigApDCI-Format0-r10
                                                       SRS-ConfigAp-r10,
                    srs-ConfigApDCI-Format1a2b2c-r10
                                                            SRS-ConfigAp-r10,
                }
        }
                                                                             OPTIONAL
                                                                                         -- Need ON
    }
}
SoundingRS-UL-ConfigDedicatedAperiodic-v1310 ::=
                                                     CHOICE {
   release
                                        NULL,
                                         SEQUENCE {
    setup
                                            SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-v1310
        srs-ConfigApDCI-Format4-v1310
    OPTIONAL, --Need ON
        srs-ActivateAp-v1310
                                             CHOICE {
                release
                                                 NULL,
                                                 SEQUENCE {
                setup
                    srs-ConfigApDCI-Format0-v1310
                                                        SRS-ConfigAp-v1310 OPTIONAL,
                                                                                          -- Need ON
                    srs-ConfigApDCI-Format1a2b2c-v1310 SRS-ConfigAp-v1310 OPTIONAL
                                                                                          -- Need ON
                }
        }
                                                                             OPTIONAL.
                                                                                          -- Need ON
    }
}
SoundingRS-UL-ConfigDedicatedAperiodicUpPTsExt-r13 ::= CHOICE{
    release
                                        NULL.
                                         SEQUENCE {
    setup
                                             ENUMERATED {sym2, sym4},
        srs-UpPtsAdd-r13
        srs-ConfigIndexAp-r13
                                             INTEGER (0..31),
        srs-ConfigApDCI-Format4-r13
                                            SEQUENCE (SIZE (1..3)) OF SRS-ConfigAp-r13 OPTIONAL,--
Need ON
        srs-ActivateAp-r13
                                            CHOICE {
                release
                                                NULL,
                                                SEQUENCE {
                setup
                    srs-ConfigApDCI-Format0-r13
                                                        SRS-ConfigAp-r13,
                    srs-ConfigApDCI-Format1a2b2c-r13
                                                             SRS-ConfigAp-r13
                }
        }
                                                                             OPTIONAL
                                                                                          -- Need ON
```

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```
SoundingRS-UL-ConfigDedicatedAperiodic-v1430 ::= CHOICE{
                 release
                                                                                                                                                                                     NULL,
                    setup
                                                                                                                                                                                        SEQUENCE {
                                 srs-SubframeIndication-r14
                                                                                                                                                                                                    INTEGER (1..4) OPTIONAL
                                                                                                                                                                                                                                                                                                                                                    -- Need ON
                    }
  }
SRS-ConfigAp-r10 ::= SEQUENCE {
    srs-AntennaPortAp-r10 SRS-AntennaPort,
    srs-BandwidthAp-r10 ENUMERATED {bw0, bw1, bw2, bw3},
    freqDomainPositionAp-r10 INTEGER (0..23),
    transmissionCombAp-r10 INTEGER (0..1),
    realieshiftAp-r10 ENUMERATED {cs0, cs1, cs2, cs3, realieshiftAp-r1
                                                                                                                                                                                     ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}
  }
 SRS-ConfigAp-v1310 ::= SEQUENCE {<br/>transmissionCombAp-v1310INTEGER (2..3)OPTIONAL, -- Need ORcyclicShiftAp-v1310ENUMERATED {cs8, cs9, cs10, cs11}OPTIONAL, -- Need ORtransmissionCombNum-r13ENUMERATED {n2, n4}OPTIONAL -- Need OR
}
                                                                                                                        ENUMERATED {an1, an2, an4, spare1}
  SRS-AntennaPort ::=
```

-- ASN1STOP

}

SoundingRS-UL-Config field descriptions
ackNackSRS-SimultaneousTransmission
Parameter: Simultaneous-AN-and-SRS, see TS 36.213 [23], clause 8.2. For SCells without PUCCH configured, this field is not applicable and the UE shall ignore the value.
cyclicShift, cyclicShiftAp
Parameter: n_SRS for periodic and aperiodic sounding reference signal transmission respectively except for an LAA SCell. See TS 36.211 [21], clause 5.5.3.1, where cs0 corresponds to 0 etc.
duration
Parameter: Duration for periodic sounding reference signal transmission except for an LAA SCell. See TS 36.213 [21], clause 8.2. FALSE corresponds to "single" and value TRUE to "indefinite".
freqDomainPosition, freqDomainPositionAp
Parameter: $n_{\rm RRC}$ for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21],
clause 5.5.3.2.
srs-AntennaPort, srs-AntennaPortAp
Indicates the number of antenna ports used for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21], clause 5.5.3. UE shall release <i>srs-AntennaPort</i> if <i>SoundingRS-UL-ConfigDedicated</i> is released.
srs-Bandwidth, srs-BandwidthAp
Parameter: B _{SRS} for periodic and aperiodic sounding reference signal transmission respectively, see TS 36.211 [21],
tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4. For LAA SCell only bw0 is applied.
srs-BandwidthConfig
Parameter: SRS Bandwidth Configuration. See TS 36.211, [21], tables 5.5.3.2-1, 5.5.3.2-2, 5.5.3.2-3 and 5.5.3.2-4. Actual configuration depends on UL bandwidth. bw0 corresponds to value 0, bw1 to value 1 and so on.
srs-ConfigApDCI-Format0 / srs-ConfigApDCI-Format1a2b2c / srs-ConfigApDCI-Format4
Parameters indicate the resource configurations for aperiodic sounding reference signal transmissions triggered by DCI formats 0, 1A, 2B, 2C, 4. See TS 36.213 [23], clause 8.2.
srs-ConfigIndex, srs-ConfigIndexAp
Parameter: I _{SRS} for periodic and aperiodic sounding reference signal transmission respectively except for an LAA
SCell. See TS 36.213 [23], tables 8.2-1 and 8.2-2, for periodic and TS 36.213 [23], tables 8.2-4 an8.2-5, for aperiodic SRS transmission.
srs-HoppingBandwidth
Parameter: SRS hopping bandwidth $b_{hop} \in \{0,1,2,3\}$ for periodic sounding reference signal transmission except for
an LAA SCell, see TS 36.211 [21], clause 5.5.3.2, where hbw0 corresponds to value 0, hbw1 to value 1 and so on. srs-MaxUpPts
Parameter: srsMaxUpPts, see TS 36.211 [21], clause 5.5.3.2. If this field is present, reconfiguration of $m_{ m SRS,0}^{ m max}$ applies
for UpPts, otherwise reconfiguration does not apply.
srs-SubframeConfig
Parameter: SRS SubframeConfiguration except for an LAA SCell. See TS 36.211, [21], table 5.5.3.3-1, applies for FDD whereas TS 36.211 [21], table 5.5.3.3-2, applies for TDD. sc0 corresponds to value 0, sc1 corresponds to value 1 and as an
1 and so on. srs-SubframeIndication
Parameter: SRS subframe indication in SRS parameter set configuration for aperiodic sounding reference signal
transmission on an LAA SCell configured with uplink, see TS 36.213 [23].
srs-UpPtsAdd
The field only applies for TDD and frame structure type 3, see TS 36.211 [21]. If E-UTRAN configures both
soundingRS-UL-ConfigDedicatedUpPTsExt and soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt srs-UpPtsAdd
in both fields is set to the same value. If E-UTRAN configures soundingRS-UL-PeriodicConfigDedicatedUpPTsExtList- r14 with a number of soundingRS-UL-ConfigDedicatedUpPTsExt and/or soundingRS-UL-
AperiodicConfigDedicatedList-r14 with a number of soundingRS-UL-ConfigDedicatedAperiodicUpPTsExt, srs-
UpPtsAdd in all fields are set to the same value.
transmissionComb, transmissionCombAp
Parameter: $\bar{k}_{TC} \in \{03\}$ for periodic and aperiodic sounding reference signal transmission respectively, see TS
36.211 [21], clause 5.5.3.2.

Conditional presence	Explanation
TDD	This field is optional present for TDD, need OR; it is not present for FDD and the UE shall
	delete any existing value for this field.

# SPDCCH-Config

_

The IE SPDCCH-Config is used to specify the UE specific SPDCCH configuration.

SPDCCH-Config information element

```
-- ASN1START
SPDCCH-Config-r15 ::=
                                         CHOICE {
     release
                                              NULL,
                                              SEQUENCE {
     setup
           spdcch-L1-ReuseIndication-r15
                                                                ENUMERATED {n0,n1,n2} OPTIONAL, -- Need OR
SPDCCH-Set-r15 OPTIONAL -- Need OR
                                                                SPDCCH-Set-r15
           spdcch-SetConfig-r15
     }
}
SPDCCH-Set-r15 ::= SEQUENCE (SIZE (1..4)) OF SPDCCH-Elements-r15
SPDCCH-Elements-r15 ::= CHOICE {
     release
                                                     NULL,
           spdcch-SetConfigId-r15 SEQUENCE {
      setup
           Spacen-setConfigId-r15INTEGER (0..3)spdcch-SetReferenceSig-r15ENUMERATED {crs,transmissionType-r15ENUMERATED {localspdcch-NoOfSymbols-r15INTEGER (1.2)dmrs-ScremblingINTEGER (1.2)
                                                              INTEGER (0..3) OPTIONAL, -- Need OR
ENUMERATED {crs, dmrs} OPTIONAL, -- Need OR
ENUMERATED {localised, distributed} OPTIONAL, -- Need OR
           spdcch-NoOfSymbols-r15INTEGER (1..2)OPTIONAL, -- Need ORdmrs-ScramblingSequenceInt-r15INTEGER (0..503)OPTIONAL, -- Need ORdci7-CandidatesPerAL-PDCCH-r15SEQUENCE (SIZE(1..4)) OF
                                                                      DCI7-Candidates-r15 OPTIONAL, -- Need OR
           dci7-CandidateSetsPerAL-SPDCCH-r15 SEQUENCE (SIZE(1..2)) OF
                                                                      DCI7-CandidatesPerAL-SPDCCH-r15 OPTIONAL, -- Need OR
           resourceBlockAssignment-r15
                                                                SEQUENCE {
                numberRB-InFreq-domain-r15 INTEGER (2..100),
resourceBlockAssignment-r15 BIT STRING (SIZE(98))
               numberRB-InFreq-domain-r15
                                                                                                   OPTIONAL, -- Need OR
           subslotApplicability-r15BIT STRING (SIZE(5))Oal-StartingPointSPDCCH-r15SEQUENCE (SIZE(1..4)) OFsubframeType-r15INTEGER(0..49)OrateMatchingMode-r15ENUMERATED {mbsfn, nonmbs
            }
                                                                                                   OPTIONAL, -- Need OR
                                                               INTEGER(0..49) OPTIONAL, -- Need OR
ENUMERATED {mbsfn, nonmbsfn, all} OPTIONAL, -- Need OR
ENUMERATED {m1, m2, m3, m4} OPTIONAL, -- Need OR
            . . .
     }
}
DCI7-Candidates-r15 ::=
                                                                      INTEGER (0..6)
DCI7-CandidatesPerAL-SPDCCH-r15 ::=
                                                                      SEQUENCE (SIZE(1..4)) OF DCI7-Candidates-r15
```

-- ASN1STOP

SPDCCH-Config field descriptions
al-StartingPointSPDCCH
Indicates the starting SCCE index for an aggregation level, see TS 36.213 [23], clause 9.1.6.
dci7-Candidates
Number of candidates in each aggregation level for DCI format 7. The number of PDCCH/SPDCCH candidate(s)
M_DCI format 7^((L)) at aggregation level L for monitoring DCI format 7 in PDCCH and SPDCCH region shall conform
to the following restriction:
<ul> <li>less than or equal to 2 for aggregation level 4 and 8,</li> </ul>
less than or equal to 6 for aggregation level 1 and 2  dci7-CandidatesPerAL-SPDCCH
SPDCCH candidates configured per aggregation level in SPDCCH region
dmrs-ScramblingSeqSPDCCH
The DMRS scrambling sequence initialization parameter $n_{\mathrm{ID},i}^{\mathrm{SPDCCH}}$ defined in TS 36.211 [21], clause 6.10.3A.1.
numberRB-InFreq-domain
Indicates the number of resource-blocks in the frequency domain used for the SPDCCH set. There is no restriction on
the number of RBs in the frequency domain that can be configured to an SPDCCH resouce set (up to 100), but at
least two need to be configured to contain at least one SCCE. The granularity of resource block allocation in
frequency domain for configuring an SPDCCH resource set is one in case spdcch-SetReferenceSig-r15 is set to crs.
The granularity of resource block allocation for configuring an SPDCCH resource set is two in case sPDCCH- SetReferenceSig-r15 is set to dmrs.
rateMatchingMode
Indicates, per resource-set, the mode of SPDCCH rate-matching operation
<ul> <li>Mode 1: UE rate-matches only around the DCI format 7 scheduling the slot or subslot PDSCH (if transmitted in</li> </ul>
theSPDCCH resouce-set), otherwise no rate-matching is performed for the RB set.
Mode 2: UE rate-matches around the whole SPDCCH resource set
• Mode 3: UE rate-matches around the whole SPDCCH resource set if DCI format 7 scheduling the slot or subslot
PDSCH is found in the resource-set, otherwise no rate-matching is performed for the RB set.
Mode 4: UE rate-matches around the whole SPDCCH resource set if DCI format 7 scheduling the slot or subslot
PDSCH is not found in the resource-set, otherwise UE rate-matches only around the DCI format 7 scheduling the slot
or subslot PDSCH (if transmitted in the SPDCCH resource-set)
If the DCI format 7 scheduling the slot or subslot PDSCH is found on a candidate belonging to two SPDCCH resource
sets, the DCI format 7 is assumed to be found in both resource sets.
<i>resourceBlockAssignment</i> Indicates the index to a specific combination of physical resource block in frequency for SPDCCH set, see TS 36.213
[23], clause 9.1.4.4. The value range is dependent on the combinatorial number defined in 36.213 [23], clause 9.1.4.4
with the assumption of no limitation in the number of RBs in frequency domain configured by the set.
spdcch-NoOfSymbols
Indicates the number of OFDM symbols that the CRS based SPDCCH is mapped over.
spdcch-L1-ReuseIndication
For the up to two resource sets configured with the same subframeType applicability, the SPDCCH-L1-
ReuseIndication defines the allowed combinations for the two resource sets: {1,1}, {2,0} or {0,2} corresponding to the
values n0, n1 and n2 repsectively. In case one resource set is configured, the allowed combinations are {2, 0} or {0,2}
corresponding to n1 or n2. EUTRAN does not configure n0 in case one resource set is configured.
spdcch-SetConfigId
Indicates the ID of the SPDCCH set configured in SPDCCH-Elements. Maximum two sets can be configured for
MBSFN and two for non-MBSFN.
spdcch-SetReferenceSig Indicates CRS or DMRS based SPDCCH set.
subframeType
Indicates applicable subframe type(s) for the SPDCCH set. CRS-based SPDCCH is only applied to non-MBSFN
subframe.
subslotApplicability
Indicates the set of subslots within the subframe where SPDCCH candidate set per aggregation levels applies, see
DCI7-CandidateSetsPerAL-SPDCCH. The bitmap applies to the 5 DL subslot indices in a DL subframe. The first
element in the sequence DCI7-CandidateSetsPerAL-SPDCCH applies to the indicated subslotApplicability. The
second element in the sequence (if present) applies to the complement of the subslotApplicability.
transmissionType
Indicates whether distributed or localized SPDCCH transmission mode is used as defined in TS 36.211 [21], clause
6.8A.1.

# - SPS-Config

The IE SPS-Config is used to specify the semi-persistent scheduling configuration.

ASN1START				
<pre>SPS-Config ::= SEQUENCE {     semiPersistSchedC-RNTI     sps-ConfigDL     sps-ConfigUL }</pre>	C-RNTI SPS-ConfigDL SPS-ConfigUL	OPTIONAL, OPTIONAL, OPTIONAL	Need Need Need	1 ON
<pre>SPS-Config-v1430 ::= SEQUENCE {     ul-SPS-V-RNTI-r14     sl-SPS-V-RNTI-r14     sps-ConfigUL-ToAddModList-r14     sps-ConfigUL-ToReleaseList-r14     sps-ConfigSL-ToAddModList-r14     sps-ConfigSL-ToReleaseList-r14 }</pre>	SPS-ConfigSL-To	ReleaseList-r14 OPT	IONAL, IONAL, IONAL,	Need OR Need OR Need ON Need ON Need ON Need ON
SPS-ConfigUL-ToAddModList-r14 ::= S	EQUENCE (SIZE (1ma	xConfigSPS-r14)) OF	SPS-ConfigU	
SPS-ConfigUL-ToReleaseList-r14 ::=	SEQUENCE (SIZE (1m	axConfigSPS-r14)) OF	SPS-Config	Index-r14
SPS-ConfigSL-ToAddModList-r14 ::= S	EQUENCE (SIZE (1ma	xConfigSPS-r14)) OF	SPS-ConfigSI	L-r14
SPS-ConfigSL-ToReleaseList-r14 ::=	SEQUENCE (SIZE (1m	axConfigSPS-r14)) OF	SPS-Config	Index-r14
<pre>SPS-Config-v1530 ::= SEQUENCE {    semiPersistSchedC-RNTI-r15    sps-ConfigDL-r15    sps-ConfigUL-STTI-ToAddModList-    sps-ConfigUL-STTI-ToReleaseList    sps-ConfigUL-ToAddModList-r15    sps-ConfigUL-ToReleaseList-r15 }</pre>	-r15 SPS-ConfigUL-ST SPS-ConfigUL-To	TI-ToReleaseList-r15	L, OPTIONAL,	Need OR Need ON Need ON Need ON Need ON Need ON
SPS-Config-v1540 ::= SEQUENCE { sps-ConfigDL-STTI-r15	SPS-ConfigDL-ST	mr1C	ODUTONAT	Need OD
}	SPS-COILIGDE-SI	11-115	OPTIONAL	Need OR
SPS-ConfigUL-STTI-ToAddModList-r15 r15	::= SEQUENCE (SIZE (	1maxConfigSPS-r15)	) OF SPS-Co	nfigUL-STTI-
SPS-ConfigUL-STTI-ToReleaseList-r15	::= SEQUENCE (SIZE	(1maxConfigSPS-r15	)) OF SPS-Co	onfigIndex-r15
SPS-ConfigUL-ToAddModList-r15 ::= S	EQUENCE (SIZE (1ma	xConfigSPS-r15)) OF	SPS-ConfigU	-
SPS-ConfigUL-ToReleaseList-r15 ::=	SEQUENCE (SIZE (1m	axConfigSPS-r15)) OF	SPS-Config	Index-r15
SPS-ConfigDL ::= CHOICE{ release setup semiPersistSchedIntervalDL	sf128, spare5,	f20, sf32, sf40, sf6 sf160, sf320, sf640, spare4, spare3, spa	spare6,	
numberOfConfSPS-Processes n1PUCCH-AN-PersistentList	sparel} INTEGER (1. N1PUCCH-AN-			
[[ twoAntennaPortActivated release setup n1PUCCH-AN-Pers	NULL, SEQUENC	E { UCCH-AN-PersistentLi	st	
}			OPTIONAL	Need ON
}				
SPS-ConfigUL ::= CHOICE { release setup semiPersistSchedIntervalUL	sf128,	f20, sf32, sf40, sf6 sf160, sf320, sf640, 30, sf3-v1430, sf4-v	sfl-v1430,	1430,

# SPS-Config information element

```
implicitReleaseAfter ENUMERATED {e2, e3, e4, e8},
       p0-Persistent
                                          SEQUENCE {
           p0-NominalPUSCH-Persistent
                                              INTEGER (-126..24),
           p0-UE-PUSCH-Persistent
                                              INTEGER (-8..7)
              OPTIONAL,
                                                                      -- Need OP
       twoIntervalsConfig
                                         ENUMERATED {true}
                                                                     OPTIONAL, -- Cond TDD
        [[ p0-PersistentSubframeSet2-r12
                                              CHOICE {
               release
                                                  NULL,
               setup
                                                  SEOUENCE {
                  p0-NominalPUSCH-PersistentSubframeSet2-r12
                                                                    INTEGER (-126..24),
                                                                     INTEGER (-8..7)
                   p0-UE-PUSCH-PersistentSubframeSet2-r12
               }
           }
                                                                     OPTIONAL
                                                                                 -- Need ON
        ]],
       [[ numberOfConfUlSPS-Processes-r13
                                                                    OPTIONAL
                                                INTEGER (1..8)
                                                                                 -- Need OR
       ]],
                                                  ENUMERATED {true}
           fixedRV-NonAdaptive-r14
                                                                         OPTIONAL,
        [[
                                                                                     -- Need OR
                                                 SPS-ConfigIndex-r14 OPTIONAL, -- Need OR
           sps-ConfigIndex-r14
                                                  ENUMERATED {
           semiPersistSchedIntervalUL-v1430
                                          sf50, sf100, sf200, sf300, sf400, sf500,
                                          sf600, sf700, sf800, sf900, sf1000, spare5,
                                          spare4, spare3, spare2, spare1} OPTIONAL -- Need OR
       11,
                                          ENUMERATED {cs0, cs1, cs2, cs3, cs4, cs5, cs6, cs7}
       [[ cyclicShiftSPS-r15
                                             OPTIONAL, -- Need ON
    -- eNote (TBC) that no separate STTI field is required (alike in merged CR)
          harq-ProcID-Offset-r15INTEGER (0..7)OPTIONAL, -- Need ONrv-SPS-UL-Repetitions-r15ENUMERATED {ulrvseq1, ulrvseq2, ulrvseq3} OPTIO
                                              ENUMERATED {ulrvseq1, ulrvseq2, ulrvseq3} OPTIONAL,
-- Need ON
           tpc-PDCCH-ConfigPUSCH-SPS-r15 TPC-PDCCH-Config
                                                                    OPTIONAL, -- Need ON
           totalNumberPUSCH-SPS-UL-Repetitions-r15 ENUMERATED {n2,n3,n4,n6} OPTIONAL, -- Need ON
                                              SPS-ConfigIndex-r15 OPTIONAL -- Cond SPS
           sps-ConfigIndex-r15
       ]]
   }
}
SPS-ConfigSL-r14 ::= SEQUENCE {
   sps-ConfigIndex-r14
                                  SPS-ConfigIndex-r14,
   semiPersistSchedIntervalSL-r14 ENUMERATED {
                                      sf20, sf50, sf100, sf200, sf300, sf400,
                                       sf500, sf600, sf700, sf800, sf900, sf1000,
                                       spare4, spare3, spare2, spare1}
}
                              INTEGER (1..maxConfigSPS-r14)
SPS-ConfigIndex-r14 ::=
SPS-ConfigIndex-r15 ::=
                             INTEGER (1..maxConfigSPS-r15)
N1PUCCH-AN-PersistentList ::=
                                 SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)
N1SPUCCH-AN-PersistentList-r15 ::=
                                    SEQUENCE (SIZE (1..4)) OF INTEGER (0..2047)
SPS-ConfigDL-STTI-r15 ::= CHOICE{
                                  NULL.
   release
                                  SEQUENCE {
   setup
       semiPersistSchedIntervalDL-STTI-r15
                                              ENUMERATED {
                                              sTTI1, sTTI2, sTTI3, sTTI4, sTTI6, sTTI8, sTTI12,
STTI16.
                                              sTTI20, sTTI40, sTTI60, sTTI80, sTTI120, sTTI240,
                                              spare2, spare1},
                                              INTEGER (1..12),
       numberOfConfSPS-Processes-STTI-r15
       twoAntennaPortActivated-r15
                                          CHOICE {
               release
                                              NULL
                                              SEQUENCE {

1-r15 N1SPUCCH-AN-PersistentList-r15
               setup
                   n1SPUCCH-AN-PersistentListP1-r15
               }
           }
                                                                     OPTIONAL, -- Need ON
                                            INTEGER (0..5),
       sTTI-StartTimeDL-r15
       tpc-PDCCH-ConfigPUCCH-SPS-r15 TPC-PDCCH-Config
                                                                    OPTIONAL, -- Need ON
       . . .
   }
}
SPS-ConfigUL-STTI-r15 ::= CHOICE {
                                  NULL,
   release
   setup
                                  SEOUENCE {
```

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	semiPersistSchedIntervalUL-STTI-r15	ENUMERATED { stti1, stti2, stti3, st	II4, sTTI6, sTTI8, sTTI12,
sTTI16,		sTTI20, sTTI40, sTTI60, spare2, spare1},	sTTI80, sTTI120, sTTI240,
	<pre>implicitReleaseAfter p0-Persistent-r15</pre>	ENUMERATED {e2, e3, e4, SEQUENCE {	e8},
	p0-NominalSPUSCH-Persistent-r15	INTEGER (-12624),	
	p0-UE-SPUSCH-Persistent-r15 }	INTEGER (-87)	OPTIONAL, Need OP
	twoIntervalsConfig-r15 p0-PersistentSubframeSet2-r15	ENUMERATED {true} CHOICE {	OPTIONAL, Cond TDD
	release	NULL,	
	setup p0-NominalSPUSCH-Persist		INTEGER (-12624),
	p0-UE-SPUSCH-PersistentS }	ubframeSet2-r15	INTEGER (-87)
	} numberOfConfUL-SPS-Processes-STTI-r1	5 INTEGER (112)	OPTIONAL, Need ON OPTIONAL, Need OR
		INTEGER (05),	offional, - Need on
	tpc-PDCCH-ConfigPUSCH-SPS-r15	TPC-PDCCH-Config	OPTIONAL, Need ON
	cyclicShiftSPS-sTTI-r15	ENUMERATED {cs0, cs1, cs2,	cs3, cs4, cs5, cs6, cs7} OPTIONAL, Need ON
	5	BOOLEAN	OPTIONAL, Need ON
	-	INTEGER (015)	OPTIONAL, Need ON
Need ON	-	ENUMERATED {ulrvseq1, ulrvs	
	sps-ConfigIndex-r15 SPS-ConfigIn tbs-scalingFactorSubslotSPS-UL-Repet		
Need ON	CDS-SCATTINGFACTOLSUDSTOLSPS-OL-Repet	ICIONS-IIS ENOMERATED (110,	III2; OFIIONAL,
Need ON	totalNumberPUSCH-SPS-STTI-UL-Repetit	ions-r15 ENUMERATED {n2,:	n3,n4,n6} OPTIONAL,
Need on			
}			
}			
ASN1S	TOP		

# SPS-Config field descriptions

### cyclicShiftSPS, cyclicShiftSPS-sTTI,

Indicates the cyclic shift  $n_{\text{DMRS}}^{(2)}$  to be used for the UE-specific reference signal in case of UL SPS, see TS 36.211 [5] clause 5.2.1.1.

#### fixedRV-NonAdaptive

If this field is present and *skipUplinkTxSPS* is configured, non-adaptive retransmissions on configured uplink grant uses redundancy version 0, otherwise the redundancy version for each retransmission is updated based on the sequence of redundancy versions as described in TS 36.321 [6].

#### harq-ProcID-offset

If configured, this field indicates the offset used in deriving the HARQ process IDs, see TS 36.321 [6], clause 5.4.1. *Ifdma-Config-SPS* 

Indicated  $\overline{\sigma}$  to be used for the UE-specific reference signal in case of UL SPS see TS 36.211 [5], clause 5.2,1.1. *implicitReleaseAfter* 

Number of empty transmissions before implicit release, see TS 36.321 [6], clause 5.10.2. Value e2 corresponds to 2 transmissions, e3 corresponds to 3 transmissions and so on. If *skipUplinkTxSPS* is configured, the UE shall ignore this field.

### n1PUCCH-AN-PersistentList, n1PUCCH-AN-PersistentListP1

List of parameter:  $n_{PUCCH}^{(1,p)}$  for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1.

Field *n1-PUCCH-AN-PersistentListP1* is applicable only if the *twoAntennaPortActivatedPUCCH-Format1a1b* in *PUCCH-ConfigDedicated-v1020* is set to *true*. Otherwise the field is not configured.

# numberOfConfSPS-Processes

The number of configured HARQ processes for downlink Semi-Persistent Scheduling, see TS 36.321 [6]. *numberOfConfSPS-Processes-STTI* 

The number of configured HARQ processes for downlink Semi-Persistent Scheduling for sTTI in DL, see TS 36.321 [6].

#### numberOfConfUISPS-Processes

The number of configured HARQ processes for uplink Semi-Persistent Scheduling, see TS 36.321 [6]. E-UTRAN always configures this field for asynchronous UL HARQ. Otherwise it does not configure this field.

# numberOfConfUL-SPS-Processes-STTI

The number of configured HARQ processes for uplink Semi-Persistent Scheduling for sTTI in UL, see TS 36.321 [6]. E-UTRAN always configures this field for asynchronous UL HARQ. Otherwise it does not configure this field. **p0-NominalPUSCH-Persistent**, **p0-NominalSPUSCH-Persistent** 

Parameter:  $P_{O_{NOMINAL_{PUSCH}}(0)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm step 1. This field is applicable for

persistent scheduling, only. If choice setup is used and *p0-Persistent* is absent, apply the value of *p0-NominalPUSCH* for *p0-NominalPUSCH-Persistent*. If uplink power control subframe sets are configured by *tpc-SubframeSet*, this field applies for uplink power control subframe set 1.

p0-NominalPUSCH-PersistentSubframeSet2, p0-NominalSPUSCH-PersistentSubframeSet2

Parameter:  $P_{O_NOMINAL_PUSCH}(0)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm step 1. This field is applicable for persistent scheduling, only. If *p0-PersistentSubframeSet2-r12* is not configured, apply the value of *p0*-

NominalPUSCH-SubframeSet2-r12 for p0-NominalPUSCH-PersistentSubframeSet2. E-UTRAN configures this field only if uplink power control subframe sets are configured by *tpc-SubframeSet*, in which case this field applies for uplink power control subframe set 2.

# p0-UE-PUSCH-Persistent

Parameter: P_{O UE PUSCH} (0) . See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for persistent

scheduling, only. If choice setup is used and *p0-Persistent* is absent, apply the value of p0-UE-PUSCH for *p0-UE-PUSCH-Persistent*. If uplink power control subframe sets are configured by *tpc-SubframeSet*, this field applies for uplink power control subframe set 1.

#### p0-UE-PUSCH-PersistentSubframeSet2

Parameter: PO UE PUSCH (0) . See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for persistent

scheduling, only. If *p0-PersistentSubframeSet2-r12* is not configured, apply the value of *p0-UE-PUSCH-SubframeSet2* for *p0-UE-PUSCH-PersistentSubframeSet2*. E-UTRAN configures this field only if uplink power control subframe sets are configured by *tpc-SubframeSet*, in which case this field applies for uplink power control subframe set 2.

# rv-SPS-STTI-UL-Repetitions

#### rv-SPS-UL-Repetitions

### semiPersistSchedC-RNTI

Semi-persistent Scheduling C-RNTI, see TS 36.321 [6]. If *sps-Config* is present for more than one cells in the same cell group, *semiPersistSchedC-RNTI* is present in only one *sps-Config*.

SPS-Config field descriptions	
semiPersistSchedIntervalDL	
Semi-persistent scheduling interval in downlink, see TS 36.321 [6]. Value in number of	sub-frames. Value sf10
corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. For TDE	
parameter down to the nearest integer (of 10 sub-frames), e.g. sf10 corresponds to 10	
	sub-mariles, sisz corresponds
to 30 sub-frames, sf128 corresponds to 120 sub-frames.	
semiPersistSchedIntervalDL-STTI	
Semi-persistent scheduling interval for sTTI in downlink, see TS 36.321 [6]. Value in nu	
corresponds to a spacing of 1 sTTI interval, sTTI2 corresponds to 2 spacings of sTTI in	
equal to sub-slot of 2 symbols or 3 symbols when the type of 2OS sTTI is configured, of	or e.g. sTTI1 equal to slot of 7
symbols when type of 7OS sTTI is configured. SPS for sTTI is not supported for TDD.	
semiPersistSchedIntervalSL	
Semi-persistent scheduling interval in sidelink, see TS 36.321 [6]. Value in number of s	sub-frames. Value sf20
corresponds to 20 sub-frames, sf50 corresponds to 50 sub-frames and so on.	
semiPersistSchedIntervalUL	
Semi-persistent scheduling interval in uplink, see TS 36.321 [6]. Value in number of su	
corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. For TDE	
persistent scheduling interval is greater than or equal to 10 sub-frames, the UE shall re	
nearest integer (of 10 sub-frames), e.g. sf10 corresponds to 10 sub-frames, sf32 corre	
corresponds to 120 sub-frames. If semiPersistSchedIntervalUL-v1430 is configured, th	
extension (and ignores semiPersistSchedIntervalUL i.e. without suffix).	
semiPersistSchedIntervalUL-STTI	
Semi-persistent scheduling interval for sTTI in uplink, see TS 36.321 [6]. Value in num	ber of sTTL Value sTTH
corresponds to a spacing of 1 sTTI interval, sTTI2 corresponds to 2 spacings of sTTI in	
equal to sub-slot of 2 symbols or 3 symbols when the type of 2OS sTTI is configured, of	or e.g. s1111 equal to slot of 7
symbols when type of 7OS sTTI is configured. SPS for sTTI is not supported for TDD.	
sI-SPS-V-RNTI	
SL Semi-Persistent Scheduling V-RNTI for V2X sidelink communication, see TS 36.32	1 [6].
sps-ConfigIndex	• •
Indicates the index of one of multiple SL/UL SPS configurations.	
sps-ConfigDL-STTI	
If sps-ConfigDL-sTTI-r15 is signalled, the UE ignores sps-ConfigDL.	
sps-ConfigSL-ToAddModList	
Indicates the SL SPS configurations to be added or modified, identified by SPS-Config	ndex.
sps-ConfigSL-ToReleaseList	
Indicates the SL SPS configurations to be released, identified by SPS-ConfigIndex.	
sps-ConfigUL-STTI-ToAddModList	
Indicates the UL sTTI SPS configurations to be added or modified, identified by SPS-C	ConfigIndex. If this list includes
more than one entry, E-UTRAN includes totalNumberPUSCH-SPS-STTI-UL-Repetition	
sps-ConfigUL-STTI-ToReleaseList	
Indicates the UL sTTI SPS configurations to be released, identified by SPS-ConfigInde	JX.
sps-ConfigUL-ToAddModList	
Indicates the UL SPS configurations to be added or modified, identified by SPS-Config	
than one entry, E-UTRAN includes <i>totalNumberPUSCH-SPS-UL-Repetitions</i> in each e	entry.
sps-ConfigUL-ToReleaseList	
Indicates the UL SPS configurations to be released, identified by SPS-ConfigIndex.	
sTTI-StartTimeDL	
Indicates the DL sTTI index start offset for SPS (re-)initialization, see TS 36.321 [6].	
sTTI-StartTimeUL	
ndicates the UL sTTI index start offset for SPS (re-)initialization, see TS 36.321 [6].	
tbs-scalingFactorSubslotSPS-UL-Repetitions	
ndicates the TBS scaling factor of subslot PUSCH for UL SPS repetitions. Value n6 co	orresponds to 1/6 and value n12
corresponds to 1/12.	-
totalNumberPUSCH-SPS-STTI-UL-Repetitions	
Indicates the total number of UL transmissions for slot or subslot UL SPS repetitions.	f the LIE is configured with LU
SPS and the configured number of SPS PUSCH transmissions k>1, simultaneous tran	
	ISTUISSION OF FUSCH and
PUCCH is not configured.	
totalNumberPUSCH-SPS-UL-Repetitions	
ndicates the total number of UL transmissions for subframe UL SPS repetitions. If the	UE is configured with UL SPS
and the configured number of SPS PUSCH transmissions k>1, simultaneous transmiss	
not configured.	
tpc-PDCCH-ConfigPUCCH-SPS	
	TC 26 212 [22] when 000
PDCCH configuration for power control of slot/subslot-PUCCH using format 3/3A, see	13 30.212 [22], When SPS-
ConfigDL-STTI is configured.	

#### SPS-Config field descriptions

#### tpc-PDCCH-ConfigPUSCH-SPS

PDCCH configuration for power control of slot/subslot-PUSCH using format 3/3A, see TS 36.212 [22], when SPS-ConfigUL-STTI is configured. If a UE is configured with multiple UL SPS configurations in a serving cell, the same TPC index for DCI format 3/3A applies to all the UL SPS configurations in the serving cell.

# twoIntervalsConfig

Trigger of two-intervals-Semi-Persistent Scheduling in uplink. See TS 36.321 [6], clause 5.10. If this field is present and the configured Semi-persistent scheduling interval greater than or equal to 10 sub-frames, two-intervals-SPS is enabled for uplink. Otherwise, two-intervals-SPS is disabled.

#### ul-SPS-V-RNTI

UL Semi-Persistent Scheduling V-RNTI for UEs capable of multiple uplink SPS configurations and which support V2X communication, see TS 36.321 [6].

Conditional presence	Explanation
TDD	This field is optional present for TDD, need OR; it is not present for FDD and the UE shall
	delete any existing value for this field.
SPS	This field is optional present if sps-ConfigIndex-r14 is not configured, need OR; otherwise
	it is not present.

# SPUCCH-Config

The IE SPUCCH-Config is used to specify the UE specific SPUCCH configuration.

#### SPUCCH-Config information element

-- ASN1START

```
SPUCCH-Config-r15 ::= CHOICE {
                                         NULL,
    release
         spucch-Set-r15
    setup
                                          SEQUENCE {
                                             SPUCCH-Set-r15 OPTIONAL, -- Need ON
         twoAntennaPortActivatedSPUCCH-Formatlalb-r15 ENUMERATED {true} OPTIONAL,
                                                                                                     -- Need OR
             n3SPUCCH-AN-List-r15 SEQUENCE {
         dummy
                                                  SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)
         }
    }
}
SPUCCH-Config-v1550 ::= CHOICE {
                                          NULL.
    release
                                          SEOUENCE {
    setup
                                                              SEQUENCE {
         twoAntennaPortActivatedSPUCCH-Format3-v1550
             n3SPUCCH-AN-List-v1550
                                         SEQUENCE (SIZE (1..4)) OF INTEGER (0..549)
         }
    }
}
SPUCCH-Set-r15 ::= SEQUENCE (SIZE (1..4)) OF SPUCCH-Elements-r15
SPUCCH-Elements-r15 ::= CHOICE {
    release
                                          NULL,
                                          SEQUENCE {
    setup
                                             SEQUENCE (SIZE(1..4)) OF INTEGER (0..1319) OPTIONAL, -- Need
         nlSubslotSPUCCH-AN-List-r15
OR
                                              INTEGER (0..1517,
INTEGER (0..3959) OPTIONAL, -- Need OR
OPTIONAL, -- Need OR
         n1SlotSPUCCH-FH-AN-List-r15
                                              INTEGER (0..1319)
                                                                         OPTIONAL, -- Need OR
         nlSlotSPUCCH-NoFH-AN-List-r15
         n3SPUCCH-AN-List-r15INTEGER (0..549)OPTIONAL, -- Need ORn4SPUCCHSlot-Resource-r15SEQUENCE (SIZE(1..2)) OF N4SPUCCH-Resource-r15OPTIONAL, --
         n3SPUCCH-AN-List-r15
                                             INTEGER (0..549)
Need OR
         n4SPUCCHSubslot-Resource-r15
                                              SEQUENCE (SIZE(1..2)) OF N4SPUCCH-Resource-r15 OPTIONAL, --
Need OR
         n4maxCoderateSlotPUCCH-r15
         n4maxCoderateSlotPUCCH-r15INTEGER (0..7)OPTIONAL, -- Needn4maxCoderateSubslotPUCCH-r15INTEGER (0..7)OPTIONAL, -- Needn4maxCoderateMultiResourceSlotPUCCH-r15INTEGER (0..7)OPTIONAL, -- Needn4maxCoderateMultiResourceSlotPUCCH-r15INTEGER (0..7)OPTIONAL, -- Need
                                                                          OPTIONAL, -- Need OR
                                                                          OPTIONAL, -- Need OR
                                                                                                 -- Need OR
                                                                                                  -- Need OR
    }
}
N4SPUCCH-Resource-r15 ::= SEQUENCE {
    n4startingPRB-r15
                                          INTEGER (0..109),
```

n4numberOfPRB-r15

INTEGER (0..7)

-- ASN1STOP

}

_

# SPUCCH-Config field descriptions

This field is not used in the specification. If received it shall be ignored by the UE. <b>n1SlotSPUCCH-FH-AN-List</b> Resource configuration for slot-SPUCCH format 1 when frequency hopping is enabled. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SlotSPUCCH-NoFH-AN-List</b> Resource configuration for slot-SPUCCH format 1 when frequency hopping is disabled. Parameter: $n_{SPUCCH}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple esource configuration. <b>n4muberOfPRB.n4nuberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4.		
<b>n1SlotSPUCCH-FH-AN-List</b> Resource configuration for slot-SPUCCH format 1 when frequency hopping is enabled. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SlotSPUCCH-NoFH-AN-List</b> Resource configuration for slot-SPUCCH format 1 when frequency hopping is disabled. Parameter: $n_{SPUCCH}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SlotSPUCCH-AN-List</b> Resource configuration for slot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple esource configuration. <b>n4maxCoderateMultiResourceSlotPUCCH</b> , <b>n4maxCoderateMultiResourceSubslotPUCCH ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission </b>	dummy	
Resource configuration for slot-SPUCCH format 1 when frequency hopping is enabled. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SlotSPUCCH-NoFH-AN-List</b> Resource configuration for slot-SPUCCH format 1 when frequency hopping is disabled. Parameter: $n_{SPUCCH}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple esource configuration. <b>n4maxCoderateSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>		
The second seco		
<b>n1SlotSPUCCH-NoFH-AN-List</b> Resource configuration for slot-SPUCCH format 1 when frequency hopping is disabled. Parameter: $n_{SPUCCH}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple esource configuration. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>	Si Coon	
Resource configuration for slot-SPUCCH format 1 when frequency hopping is disabled. Parameter: $n_{SPUCCH}^{(3,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH</b> , <b>n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH</b> , <b>n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. <b>n4maxCoderateMultiResourceSlotPUCCH</b> , <b>n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. <b>n4maxCoderateMultiResourceSlotPUCCH</b> , <b>n4maxCoderateMultiResourceSubslotPUCCH</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>		
antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n1SubslotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna port P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple esource configuration. <b>n4numberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>		
<b>n1SubsiotSPUCCH-AN-List</b> Resource configuration for subslot-SPUCCH format 1. Parameter: $n_{SPUCCH}^{(1,p)}$ for antenna port P0 and for antenna portP1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multipleresource configuration. <b>n4numberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>		
P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. <b>n4mumberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>	n1SubslotSPUCCH-AN-List	
P1 respectively, see TS 36.213 [23], clause 10.1. <b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. <b>n4mumberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>	Resource configuration for subslot-SPUCCH format 1 Parameter: $\eta_{\rm constraint}^{(1,p)}$ for antenna port P0 and for antenna po	ort
<b>n3SPUCCH-AN-List</b> Resource index for slot-SPUCCH format 3: $n_{SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1. <b>n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple         resource configuration. <b>n4numberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>	brocen	
m4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH         ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission.         n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH         ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple         ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple         resource configuration.         n4numberOfPRB, n4numberOfPRBSubslot         Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4.         n4startingPRB	n3SPUCCH-AN-List	
Indicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission. <b>MaxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH</b> Indicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. <b>ManumberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>MateringPRB</b>	Resource index for slot-SPUCCH format 3: $n_{ m SPUCCH}^{(3,p)}$ , see TS 36.213 [23], clause 10.1.	
n4maxCoderateMultiResourceSlotPUCCH, n4maxCoderateMultiResourceSubslotPUCCH         ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple         resource configuration.         n4numberOfPRB, n4numberOfPRBSubslot         Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4.         n4startingPRB	n4maxCoderateSlotPUCCH, n4maxCoderateSubslotPUCCH	
ndicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission in case of multiple resource configuration. <b>n4numberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>	Indicates the maximum coding rate for slot-PUCCH and subslot-PUCCH format 4 transmission.	
resource configuration. <b>n4numberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>		
<b>n4numberOfPRB, n4numberOfPRBSubslot</b> Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4. <b>n4startingPRB</b>		
Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format 4.	n4numberOfPRB, n4numberOfPRBSubslot	
•	Parameter $n_{SPUCCH}^{(4)}$ see TS 36.213 [23], Table 10.1.1-2 for determining SPUCCH resource(s) of SPUCCH format	4.
Parameter $n_{SPUCCH}^{(4)}$ see TS 36.211 [21], clause 5.4A.3 for determining SPUCCH resource(s) of SPUCCH format 4.	n4startingPRB	
	Parameter $n_{\scriptscriptstyle SPUCCH}^{\scriptscriptstyle (4)}$ see TS 36.211 [21], clause 5.4A.3 for determining SPUCCH resource(s) of SPUCCH format 4	1.
	twoAntennaPortActivatedSPUCCH-Format1a1b	
ndicates whether two antenna ports are configured for SPUCCH format 1a/1b for HARQ-ACK, see TS 36.213 [23],		
clause 10.1. The field also applies for SPUCCH format 1a/1b transmission when <i>format3</i> is configured, see TS 36.213	clause 10.1. The field also applies for SPUCCH format 1a/1b transmission when <i>format3</i> is configured, see TS 36.2 [23], clauses 10.1.2.2.2 and 10.1.3.2.2.	213
	twoAntennaPortActivatedSPUCCH-Format3	
ndicates whether two antenna ports are configured for SPUCCH format 3 for HARQ-ACK, see TS 36.213 [23], clause		use

# SRS-TPC-PDCCH-Config

The IE *SRS-TPC-PDCCH-Config* is used to specify the RNTIs and indexes for A-SRS trigger and TPC according to TS 36.212 [22].

# SRS-TPC-PDCCH-Config information element

	ASN1START		
SRS	-TPC-PDCCH-Config-r14 ::=		CHOICE {
	release	NULL,	
	setup	SEQUENCE	CE {
	srs-TPC-RNTI-r14		BIT STRING (SIZE (16)),
	startingBitOfFormat3B-r2	14	INTEGER (031),
	fieldTypeFormat3B-r14		INTEGER (14),
	srs-CC-SetIndexlist-r14		SEQUENCE (SIZE(14)) OF SRS-CC-SetIndex-r14
	OPTIONAL Cond SRS-Trig	gger-TypeA	
	1		
}	}		
SBS	-CC-SetIndex-r14 ::=	SEQUENCE {	
DICD	cc-SetIndex-r14	INTEGER (03),	
	cc-IndexInOneCC-Set-r14	INTEGER (07)	
3		INIIOIN (0,)	
J			
	ASNISTOP		

#### SRS-TPC-PDCCH-Config field descriptions

# cc-IndexInOneCC-Set

Indicates the CC index in one CC set for Type A associated with the group DCI with SRS request field (optional) and TPC commands for a PUSCH-less SCell

#### cc-SetIndex

Indicates the CC set index for Type A associated with the group DCI with SRS request field (optional) and TPC commands for a PUSCH-less SCell.

#### fieldTypeFormat3B

The type of a field within the group DCI with SRS request fields (optional) and TPC commands for a PUSCH-less SCell, which indicates how many bits in the field are for SRS request (0 or 1/2) and how many bits in the field are for TPC (1 or 2). Note that for Type A, there is a common SRS request field for all SCells in the set, but each SCell has its own TPC command bits. See TS 36.212 [22], clause 5.3.3.1.7A. EUTRAN configures this field with the same value for all PUSCH-less SCells.

#### srs-CC-SetIndexlist

Indicates the index of the SRS-TPC-PDCCH-Config for Type A trigger by the group DCI with SRS request field (optional) and TPC commands for a PUSCH-less SCell. Each set may contain at most 8 CCs. srs-TPC-RNTI

RNTI for SRS trigger and power control using DCI format 3B, see TS 36.212 [22], clause 5.1.3.1.

#### startingBitOfFormat3B

The starting bit position of a block within the group DCI with SRS request fields (optional) and TPC commands for a PUSCH-less SCell.

Conditional presence	Explanation
SRS-Trigger-TypeA	The field is mandatory present if typeA-SRS-TPC-PDCCH-Group-r14 is present.
	Otherwise the field is not present and the UE shall delete any existing value for this field.

# TDD-Config

The IE TDD-Config is used to specify the TDD specific physical channel configuration.

#### **TDD-Config** information element

```
-- ASN1START
                                   SEQUENCE {
TDD-Config ::=
    subframeAssignment
                                       ENUMERATED {
                                           sa0, sa1, sa2, sa3, sa4, sa5, sa6},
    specialSubframePatterns
                                       ENUMERATED {
                                           ssp0, ssp1, ssp2, ssp3, ssp4,ssp5, ssp6, ssp7,
                                           ssp8}
}
TDD-Config-v1130 ::=
                                   SEQUENCE {
    specialSubframePatterns-v1130
                                    ENUMERATED {ssp7,ssp9}
}
TDD-Config-v1430 ::=
                                   SEQUENCE {
                                    ENUMERATED {ssp10}
    specialSubframePatterns-v1430
}
TDD-Config-v1450 ::=
                                   SEQUENCE {
    specialSubframePatterns-v1450
                                       ENUMERATED {ssp10-CRS-LessDwPTS}
}
TDD-ConfigSL-r12 ::=
                           SEQUENCE {
    subframeAssignmentSL-r12
                                           ENUMERATED {
                                           none, sa0, sa1, sa2, sa3, sa4, sa5, sa6}
SubframeAssignment-r15 ::= ENUMERATED {sa0, sa1, sa2, sa3, sa4, sa5, sa6}
-- ASN1STOP
```

#### TDD-Config field descriptions

#### specialSubframePatterns

Indicates Configuration as in TS 36.211 [21], table 4.2-1, where *ssp0* points to Configuration 0, *ssp1* to Configuration 1 etc. Value *ssp7* points to Configuration 7 for extended cyclic prefix, value *ssp9* points to Configuration 9 for normal cyclic prefix and value *ssp10* points to Configration 10 for normal cyclic prefix. Value *ssp10-CRS-LessDwPTS* corresponds to *ssp10* without CRS transmission on the 5th symbol of DwPTS. E-UTRAN signals *ssp7* only when setting *specialSubframePatterns* (without suffix i.e. the version defined in REL-8) to *ssp4*. E-UTRAN signals value *ssp9* only when setting *specialSubframePatterns* (without suffix) to *ssp5*. E-UTRAN signals value *ssp10* or *ssp10* or *ssp10*. *CRS-LessDwPTS* only when setting *specialSubframePatterns* (without suffix) to *ssp5*. E-UTRAN signals value *ssp10* or *ssp10* or *ssp10*. *CRS-LessDwPTS* only when setting *specialSubframePatterns* (without suffix) to *ssp5*. E-UTRAN signals value *ssp10* or *ssp10*. *CRS-LessDwPTS* only when setting *specialSubframePatterns* (without suffix) to *ssp0* or *ssp5*. If *specialSubframePatterns-v1130*, *specialSubframePatterns-v1430*, or *specialSubframePatterns-v1450* is present, the UE shall ignore *specialSubframePatterns-v1430* or *specialSubframePatterns-v1450* is present, the UE shall ignore *specialSubframePatterns-v1130*. E-UTRAN does not simultanuosly configure *TDD-Config-v1430* and *TDD-Config-v1450*.

#### subframeAssignment

Indicates DL/UL subframe configuration where sa0 points to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21], table 4.2-2. E-UTRAN configures the same value for serving cells residing on same frequency band.

#### subframeAssignmentSL

Indicates UL/ DL subframe configuration where sa0 points to Configuration 0, sa1 to Configuration 1 etc. as specified in TS 36.211 [21], table 4.2-2. The value *none* means that no TDD specific physical channel configuration is applicable (i.e. the carrier on which *MasterInformationBlock-SL* is transmitted is an FDD UL carrier or the carrier on which *MasterInformationBlock-SL* is transmitted is a carrier for V2X sidelink communication).

# TimeAlignmentTimer

The IE *TimeAlignmentTimer* is used to control how long the UE considers the serving cells belonging to the associated TAG to be uplink time aligned. Corresponds to the Timer for time alignment in TS 36.321 [6]. Value in number of sub-frames. Value sf500 corresponds to 500 sub-frames, sf750 corresponds to 750 sub-frames and so on.

# TimeAlignmentTimer information element

-- ASN1START TimeAlignmentTimer ::= ENUMERATED { sf500, sf750, sf1280, sf1920, sf2560, sf5120, sf10240, infinity}

TimeReferenceInfo

### TimeReferenceInfo information elements

ASN1START			
<pre>TimeReferenceInfo-r15 ::=     time-r15     uncertainty-r15     timeInfoType-r15     referenceSFN-r15 }</pre>	SEQUENCE { ReferenceTime-r15, INTEGER (012) ENUMERATED {localClock} INTEGER (01023)	OPTIONAL, OPTIONAL, OPTIONAL	Need OR Need OR Cond TimeRef
<pre>ReferenceTime-r15 ::=     refDays-r15     refSeconds-r15     refMilliSeconds-r15     refQuarterMicroSeconds-r15 }</pre>	SEQUENCE { INTEGER (072999), INTEGER (086399), INTEGER (0999), INTEGER (03999)		
ASN1STOP			

#### TimeReferenceInfo field descriptions

#### referenceSFN

This field indicates the reference SFN for time reference information. The *time* field indicates the time at the ending boundary of the SFN indicated by *referenceSFN*. The UE considers the frame indicated by the *referenceSFN* nearest to the frame where the field is received.

If the *time* field is included in *SystemInformationBlockType16* and the *referenceSFN* field is not included, the *time* field indicates the time at the SFN boundary at or immediately after the ending boundary of the SI-window in which *SystemInformationBlockType16* is transmitted.

#### time, timeInfoType

This field indicates time reference with 0.25 us granularity. The indicated time is referenced at the network, i.e., without compensating for RF propagation delay. The indicated time in 0.25 us unit from the origin is

*refDays**86400*1000*4000 + *refSeconds**1000*4000 + *refMilliSeconds**4000 + *refQuarterMicroSeconds*. The *refDays* field specifies the sequential number of days (with day count starting at 0) from the origin of the *time* field. If *timeInfoType* is not included, the origin of the *time* field is 00:00:00 on Gregorian calendar date 6 January, 1980 (start

of GPS time). If *timeInfoType* is set to *localClock*, the interpretation of the origin of the *time* is unspecified and left up to upper layers.

If *time* field is included in *SystemInformationBlockType16*, this field is excluded when estimating changes in system information, i.e. changes of *time* should neither result in system information change notifications nor in a modification of *systemInfoValueTag* in SIB1.

#### uncertainty

This field indicates the number of LSBs which may be inaccurate in the *refQuarterMicroSeconds* field. If *uncertainty* is absent, the uncertainty of *refQuarterMicroSeconds* is not specified.

Conditional presence	Explanation
TimeRef	The field is mandatory present if <i>TimeReferenceInfo</i> is included in <i>DLInformationTransfer</i>
	message; otherwise the field is not present.

# - TPC-PDCCH-Config

The IE *TPC-PDCCH-Config* is used to specify the RNTIs and indexes for PUCCH and PUSCH power control according to TS 36.212 [22]. The power control function can either be setup or released with the IE.

# TPC-PDCCH-Config information element

```
-- ASN1START
TPC-PDCCH-Config ::=
                                          CHOICE {
    release
                                          NULL,
                                          SEQUENCE {
    setup
                                              BIT STRING (SIZE (16)),
        tpc-RNTI
        tpc-Index
                                              TPC-Index
    }
}
TPC-PDCCH-ConfigSCell-r13 ::=
                                                  CHOICE {
    release
                                          NULL .
                                          SEOUENCE {
    setup
        tpc-Index-PUCCH-SCell-r13
                                          TPC-Index
}
TPC-Index ::=
                                          CHOICE {
    indexOfFormat3
                                              INTEGER (1..15),
    indexOfFormat3A
                                              INTEGER (1..31)
}
-- ASN1STOP
```

TPC-PDCCH-Config field descriptions
indexOfFormat3
Index of N when DCI format 3 is used. See TS 36.212 [22], clause 5.3.3.1.6.
IndexOfFormat3A
Index of M when DCI format 3A is used. See TS 36.212 [22], clause 5.3.3.1.7.
tpc-Index
Index of N or M, see TS 36.212 [22], clauses 5.3.3.1.6 and 5.3.3.1.7, where N or M is dependent on the used DCI
format (i.e. format 3 or 3a).
tpc-Index-PUCCH-SCell
Index of N or M, see TS 36.212 [22], clauses 5.3.3.1.6 and 5.3.3.1.7, where N or M is dependent on the used DCI
format (i.e. format 3 or 3a).
tpc-RNTI
RNTI for power control using DCI format 3/3A, see TS 36.212 [22].

# TunnelConfigLWIP

The IE TunnelConfigLWIP is used to setup/release LWIP Tunnel.

```
-- ASN1START
TunnelConfigLWIP-r13 ::= SEQUENCE {
   ip-Address-r13 IP-Address-r13,
ike-Identity-r13 IKE-Identit
                           IKE-Identity-r13,
    [[ lwip-Counter-r13 INTEGER (0..65535) OPTIONAL -- Cond LWIP-Setup
    ]]
}
IKE-Identity-r13 ::= SEQUENCE {
   idI-r13
                          OCTET STRING
}
IP-Address-r13 ::= CHOICE {
                              BIT STRING (SIZE (32)),
   ipv4-r13
    ipv6-r13
                               BIT STRING (SIZE (128))
}
-- ASN1STOP
```

# TunnelConfigLWIP field descriptions

*ip-Address*Parameter indicates the LWIP-SeGW IP Address to be used by the UE for initiating LWIP Tunnel establishment [32]. *ike-Identity*Parameter indicates the IKE Identity elements (IDi) to be used in IKE Authentication Procedures [32]. *Iwip-Counter*Indicates the parameter used by UE for computing the security keys used in LWIP tunnel establishment, as specified in TS 33.401 [32].

Conditional presence	Explanation
LWIP-Setup	The field is mandatory present upon setup of LWIP tunnel. Otherwise the field is optional, Need ON.

# – UplinkPowerControl

The IE *UplinkPowerControlCommon* and IE *UplinkPowerControlDedicated* are used to specify parameters for uplink power control in the system information and in the dedicated signalling, respectively.

# UplinkPowerControl information elements

-- ASN1START

UplinkPowerControlCommon ::= p0-NominalPUSCH alpha

SEQUENCE {
 INTEGER (-126..24),
 Alpha-r12,

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p0-NominalPUCCH INTEGER (-127..-96), deltaFList-PUCCH DeltaFList-PUCCH, deltaPreambleMsq3 INTEGER (-1..6) } UplinkPowerControlCommon-v1020 ::= SEQUENCE { deltaF-PUCCH-Format3-r10 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2, deltaF3, deltaF4, deltaF5, deltaF6}, deltaF-PUCCH-Format1bCS-r10 ENUMERATED {deltaF1, deltaF2, spare1, spare1} } UplinkPowerControlCommon-v1310 ::= SEQUENCE { ENUMERATED {deltaF16, deltaF15, deltaF14, deltaF13, deltaF12, deltaF-PUCCH-Format4-r13 deltaF11, deltaF10, spare1} OPTIONAL, -- Need OR deltaF-PUCCH-Format5-13 ENUMERATED { deltaF13, deltaF12, deltaF11, deltaF10, deltaF9, deltaF8, deltaF7, spare1} OPTIONAL -- Need OR } UplinkPowerControlCommon-v1530 ::= SEQUENCE { deltaFList-SPUCCH-r15 DeltaFList-SPUCCH-r15 } UplinkPowerControlCommonPSCell-r12 ::= SEQUENCE { -- For uplink power control the additional/ missing fields are signalled (compared to SCell) ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2, deltaF-PUCCH-Format3-r12 deltaF3, deltaF4, deltaF5, deltaF6}, deltaF-PUCCH-Format1bCS-r12 ENUMERATED {deltaF1, deltaF2, spare2, spare1}, p0-NominalPUCCH-r12 INTEGER (-127..-96), deltaFList-PUCCH-r12 DeltaFList-PUCCH } UplinkPowerControlCommonSCell-r10 ::= SEQUENCE { p0-NominalPUSCH-r10 INTEGER (-126..24), alpha-r10 Alpha-r12 } UplinkPowerControlCommonSCell-v1130 ::= SEQUENCE { INTEGER (-1..6) deltaPreambleMsg3-r11 } UplinkPowerControlCommonSCell-v1310 ::= SEQUENCE { -- For uplink power control the additional/ missing fields are signalled (compared to SCell) p0-NominalPUCCH INTEGER (-127..-96), deltaFList-PUCCH DeltaFList-PUCCH, deltaF-PUCCH-Format3-r12 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2, deltaF3, deltaF4, deltaF5, deltaF6} OPTIONAL, -- Need OR deltaF-PUCCH-Format1bCS-r12 ENUMERATED {deltaF1, deltaF2, spare2, spare1} OPTIONAL, -- Need OR ENUMERATED {deltaF16, deltaF15, deltaF14, deltaF-PUCCH-Format4-r13 deltaF13, deltaF12, deltaF11, deltaF10, OPTIONAL, -- Need OR spare1} ENUMERATED { deltaF13, deltaF12, deltaF11, deltaF-PUCCH-Format5-13 deltaF10, deltaF9, deltaF8, deltaF7, OPTIONAL spare1} -- Need OR } UplinkPowerControlCommonPUSCH-LessCell-v1430 ::= SEQUENCE { INTEGER (-126..24) OPTIONAL, INTEGER (-126..24) OPTIONAL, p0-Nominal-PeriodicSRS-r14 -- Need OR OPTIONAL, p0-Nominal-AperiodicSRS-r14 -- Need OR -- Need OR alpha-SRS-r14 Alpha-r12 OPTIONAL } UplinkPowerControlDedicated ::= SEQUENCE { p0-UE-PUSCH INTEGER (-8..7), deltaMCS-Enabled ENUMERATED {en0, en1}, accumulationEnabled BOOLEAN, p0-UE-PUCCH INTEGER (-8..7), pSRS-Offset INTEGER (0..15), filterCoefficient FilterCoefficient DEFAULT fc4 } UplinkPowerControlDedicated-v1020 ::= SEQUENCE { OPTIONAL, deltaTxD-OffsetListPUCCH-r10 DeltaTxD-OffsetListPUCCH-r10 -- Need OR pSRS-OffsetAp-r10 INTEGER (0..15) OPTIONAL -- Need OR }

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```
UplinkPowerControlDedicated-v1130 ::= SEQUENCE {
   pSRS-OffsetAp-v1130
                                            INTEGER (16..31)
                                                                            OPTIONAL,
                                                                                         -- Need OR
                                           INTEGER (16..31)
                                                                            OPTIONAL,
                                                                                        -- Need OR
    deltaTxD-OffsetListPUCCH-v1130
                                           DeltaTxD-OffsetListPUCCH-v1130 OPTIONAL
                                                                                        -- Need OR
}
UplinkPowerControlDedicated-v1250 ::= SEQUENCE {
    set2PowerControlParameter CHOICE {
        release
                                    NULL,
           tpc-SubframeSet-r12
                                      SEQUENCE {
        setup
                                             BIT STRING (SIZE(10)),
            p0-NominalPUSCH-SubframeSet2-r12
                                                 INTEGER (-126..24),
           alpha-SubframeSet2-r12
p0-UE-PUSCH-SubframeSet2-r12
                                                Alpha-r12,
                                               INTEGER (-8..7)
        }
   }
}
UplinkPowerControlDedicated-v1530 ::= SEQUENCE {
   alpha-UE-r15
                               Alpha-r12
                                                                    OPTIONAL,
                                                                                 -- Need OR
                                                                                -- Need OR
                               INTEGER (-16..15)
                                                                    OPTIONAL
}
UplinkPowerControlDedicatedSTTI-r15 ::= SEQUENCE {
   accumulationEnabledSTTI-r15 BOOLEAN,
deltaTxD-OffsetListSPUCCH-r15 DeltaTxD-OffsetListSPUCCH-r15 OPTIONAL, -- Need OR
    uplinkPower-CSIPayload
                                  BOOLEAN
}
UplinkPUSCH-LessPowerControlDedicated-v1430 ::=
                                                   SEQUENCE {
   p0-UE-PeriodicSRS-r14
                                                INTEGER (-8..7)
                                                                       OPTIONAL,
                                                                                    -- Need OR
                                                INTEGER (-8..7)
                                                                      OPTIONAL,
                                                                                    -- Need OR
   p0-UE-AperiodicSRS-r14
   accumulationEnabled-r14
                                                BOOLEAN
}
UplinkPowerControlDedicatedSCell-r10 ::=
                                               SEOUENCE {
   p0-UE-PUSCH-r10 INTEGER (-8..7),
deltaMCS-Enabled-r10 ENUMERATED {
                                           ENUMERATED {en0, en1},
   accumulationEnabled-r10 BOOLEAN,
   pSRS-Offset-r10
pSRS-OffsetAp-r10
                                       INTEGER (0..15),
   filterCoefficient-r10
                                                                       OPTIONAL,
                                        INTEGER (0..15)
                                                                                    -- Need OR
                                        FilterCoefficient
                                                                          DEFAULT fc4,
   filterCoefficient-r10
pathlossReferenceLinking-r10
                                      ENUMERATED {pCell, sCell}
}
UplinkPowerControlDedicatedSCell-v1310 ::= SEQUENCE {
--Release 8
   p0-UE-PUCCH
                                       INTEGER (-8..7),
--Release 10
   deltaTxD-OffsetListPUCCH-r10
                                      DeltaTxD-OffsetListPUCCH-r10 OPTIONAL -- Need OR
}
Alpha-r12 ::=
                                   ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}
DeltaFList-PUCCH ::=
                                  SEQUENCE {
                                   ENUMERATED {deltaF-2, deltaF0, deltaF2},
ENUMERATED {deltaF1, deltaF3, deltaF5},
   deltaF-PUCCH-Format1
    deltaF-PUCCH-Formatlb
                                ENUMERATED {deltaF-2, deltaF0, deltaF1, deltaF2},
ENUMERATED {deltaF-2, deltaF0, deltaF2},
ENUMERATED {deltaF-2, deltaF0, deltaF2}
    deltaF-PUCCH-Format2
    deltaF-PUCCH-Format2a
    deltaF-PUCCH-Format2b
}
DeltaFList-SPUCCH-r15 := CHOICE {
        release
                               NULL.
                                SEQUENCE {
        setup
    deltaF-slotSPUCCH-Format1-r15 ENUMERATED {deltaF-1, deltaF0, deltaF1, deltaF2,
                                        deltaF3, deltaF4, deltaF5, deltaF6} OPTIONAL, --Need OR
   deltaF-slotSPUCCH-Formatla-r15 ENUMERATED {deltaF1, deltaF2, deltaF3, deltaF4,
                                       deltaF5, deltaF6, deltaF7, deltaF8} OPTIONAL, --Need OR
   deltaF-slotSPUCCH-Format1b-r15 ENUMERATED {deltaF3, deltaF4, deltaF5, deltaF6,
                                       deltaF7, deltaF8, deltaF9, deltaF10} OPTIONAL,--Need OR
    deltaF-slotSPUCCH-Format3-r15 ENUMERATED {deltaF4, deltaF5, deltaF6, deltaF7,
                                       deltaF8, deltaF9, deltaF10, deltaF11} OPTIONAL,--Need OR
   deltaF-slotSPUCCH-RM-Format4-r15
                                       ENUMERATED {deltaF13, deltaF14, deltaF15, deltaF16,
                                        deltaF17, deltaF18, deltaF19, deltaF20} OPTIONAL,
--Need OR
   deltaF-slotSPUCCH-TBCC-Format4-r15 ENUMERATED {deltaF10, deltaF11, deltaF12, deltaF13,
                                            deltaF14, deltaF15, deltaF16, deltaF17} OPTIONAL,
```

```
--Need OR
    deltaF-subslotSPUCCH-Formatlandla-r15 ENUMERATED {deltaF5, deltaF6, deltaF7, deltaF8,
                                                            deltaF9, deltaF10, deltaF11, deltaF12} OPTIONAL,
--Need OR
    deltaF-subslotSPUCCH-Formatlb-r15 ENUMERATED {deltaF6, deltaF7, deltaF8, deltaF9,
                                                       deltaF10, deltaF11, deltaF12, deltaF13} OPTIONAL,
--Need OR
    deltaF-subslotSPUCCH-RM-Format4-r15 ENUMERATED {deltaF15, deltaF16, deltaF17, deltaF18,
                                                       deltaF19, deltaF20, deltaF21, deltaF22} OPTIONAL,
--Need OR
   deltaF-subslotSPUCCH-TBCC-Format4-r15 ENUMERATED {deltaF10, deltaF11, deltaF12, deltaF13,
                                                            deltaF14, deltaF15, deltaF16, deltaF17} OPTIONAL,
--Need OR
     . . .
     }
}
DeltaTxD-OffsetListPUCCH-r10 ::= SEQUENCE {

    deltaTxD-OffsetPUCCH-Format1-r10
    ENUMERATED {dB0, dB-2},

    deltaTxD-OffsetPUCCH-Format1alb-r10
    ENUMERATED {dB0, dB-2},

    deltaTxD-OffsetPUCCH-Formatlalb-r10ENUMERATED {dB0, dB-2},deltaTxD-OffsetPUCCH-Format22a2b-r10ENUMERATED {dB0, dB-2},deltaTxD-OffsetPUCCH-Format3-r10ENUMERATED {dB0, dB-2},
     . . .
}
DeltaTxD-OffsetListPUCCH-v1130 ::= SEQUENCE {
    deltaTxD-OffsetPUCCH-Format1bCS-r11 ENUMERATED {dB0, dB-1}
}
DeltaTxD-OffsetListSPUCCH-r15 ::= SEQUENCE {
   deltaTxD-OffsetSPUCCH-Format1-r15 ENUMERATED {dB0, dB-2},
    deltaTxD-OffsetSPUCCH-Formatla-r15ENUMERATED {dB0, dB-2},deltaTxD-OffsetSPUCCH-Formatlb-r15ENUMERATED {dB0, dB-2},deltaTxD-OffsetSPUCCH-Format3-r15ENUMERATED {dB0, dB-2},
    . . .
}
-- ASN1STOP
```

whereas FALSE corresponds to "disabled".           whereas FALSE corresponds to 138, clause 5.1.1.1, where all corresponds to 0, al04 corresponds to value 0.4, al05 to 5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9, and 11 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al00 to 0.9, and 01 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 1.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 1.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 1.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 1.5, al06 to 0.6, al07 to 0.7, al08 to 0.6, al08 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to 1.5, al06 to 0.6, al07 to 0.7, al08 to 0.9, al01 to 0.7, al06 to 0.6, al01 to 0.7, al06 to 0.6, al01 to 0.7, al00 to 0.7, al07 to 0.7, al08 to 0.9, al01 to 0.9, al01 to 0.7, al01 to 7, al00 to 0.6, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.7, al00 to 0.6, al01 to 0.9, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.8, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.8, al01 to 0.9, al01 to 0.7, al02 to 0.8, al00 to 0.7, al01 to 0.7, al00 to 0.8, al01 to 0.8, al01 to 0.7, al01 to 0.1, al02 to 0.1, al02 to 0.7, al01 to 0.7, al00 to 0.6, al01 to 0.7, al00 to 0.8, al01 to 0.8, al01 to 0.9, al01 to 0.7, al01 to 0.1, al01 to 0.7, al01 to 0.7, al01 to 0.7, al01 to 0.7, al01 to 0.	UplinkPowerControl field descriptions
¹² arameter: <i>α</i> See TS 36.213 [23], clause 5.1.1.1, where all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 5, allo6 to 0.6, allo8 to 0.8, allo8 to 0.8, allo8 to 0.8 and 10 corresponds to 0, allo4 corresponds to value 0.4, allo5 to 0.5, allo6 to 0.6, allo7 to 0.7, allo8 to 0.8, allo8 to 0.9 and all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 0.5, allo6 to 0.6, allo7 to 0.7, allo8 to 0.8, allo8 to 0.9 and all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 0.5, allo6 to 0.6, allo7 to 0.7, allo8 to 0.8, allo8 to 0.9 and all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 5, allo6 to 0.6, allof to 0.7, allo8 to 0.8, allo8 to 0.9 and all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 5, allo6 to 0.6, allof to 0.7, allo8 to 0.8, allo8 to 0.9 and all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 5, allo6 to 0.6, allof to 0.7, allo8 to 0.8, allo9 to 0.9 and all corresponds to 0, allo4 corresponds to value 0.4, allo5 to 5, allo6 to 0.6, allof to 0.7, allo8 to 0.8, allo9 to 0.9 and all corresponds to 1. This field applies for uplink power control upliname set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <b>(allof 10.7, allo8 to 0.8, allo9 to 0.9 and all corresponds to 1.</b> allo4 corresponds to value 0.4, allo5 to 5, allo6 to 0.6, allo9 to 0.9 and all corresponds to 1. allo4 corresponds to 2. allo8 and so on. <b>(allof F-UCCH-FormatX)</b> detaF-subSIVDCH-FormatX detaF-subSIVDCH-FormatX detaF-subSIVDCH-FormatX detaF-subSIVDCH-FormatX, detaF-subSIVDCH-FormatX, detaF-subSIVDCH-FormatX, detaF-subSIVDCH-FormatX, detaF-subSIVDCH-FormatX detaF-subSIVDCH-FormatX detaF-subsideSIVDCH-FormatX detaF-s	accumulationEnabled, accumulationEnabledTTI Parameter: Accumulation-enabled, see TS 36.213 [23], clauses 5.1.1.1 and 5.1.3.1. TRUE corresponds to "enabled" whereas FALSE corresponds to "disabled".
ipha-SRS arameter. <i>ase</i> : See TS 36.213 [23], clause 5.1.3.1, where all corresponds to 0, al04 corresponds to value 0.4, al05 10.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. This field applies for SRS power ontor to a PUSCH-less SCell. ipha-SubframeSec arameter: <i>a</i> : See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 1, al04 corresponds to value 0.4, al05 ipha-SubframeSec arameter: <i>a</i> : See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 ipha-UE arameter: <i>a</i> : See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 ipha-UE arameter: <i>a</i> : See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to ibina-UE arameter: <i>a</i> : See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to ibina-UE and to 0.7, al06 to 0.8, al09 to 0.9 and al1 corresponds to 0, al04 corresponds to value 0.4, al05 to ibina-UE and the 0.8, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 0.40 corresponds to 0.40 and so on. ibina-PUCCH-FormatX arameter: A _{EXPCCH} ( <i>F</i> ) for the PUCCH formats 1, 1, th, 2, 2a, 2b, 3, 4, 5 and 1 b with channel selection. See TS ibina-PUCCH-FormatX arameter: A _{EXPCCH} ( <i>F</i> ) for the SPUCCH formats 1, 1, al 1, 3 and 4. See TS 36.213 [23], clause 5.1.2 where arameter: K See TS 36.213 [23], clause 5.1.1.1 Actual value 0 corresponding to state "disabled". ibina-PuccH-FormatX arameter: A _{EXPCCH} ( <i>F</i> ) for the SPUCCH corres s 22 HARQ-ACK bits, and B otherwise. ibina-Diseded arameter: A _{EXPCCH} ( <i>F</i> ) for the PUCCH correst s 22.12 AlRQ-ACK bits, and B otherwise. ibina-Diseded arameter: A _{EXPCCH} ( <i>F</i> ) for the SPUCCH correst s 22.13 [23], clause 5.1.2.1, where dB0 corresponds to 0.48, ibina-Diseded for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0.48, ibina-Coefficient Diseded for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.	
$ipha-SubframeSei2 ipha-SubframeSei2 ipha-SubframeSei2 is 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. This field applies for uplink power control ubframe set 2 if uplink power control subframe set 3 are configured by tpc-SubframeSet. ipha-UE 'arameter: Care See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to 1.5, al06 to 0.8, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. ieitaF-PUCCH-FormatX 'arameter: \Delta_{\rm p}_{\rm PUCCH}(F) for the PUCCH formats 1, 1b, 2, 2a, 2b, 3, 4, 5 and 1b with channel selection. See TS ieitaF-PUCCH-FormatX, dettaF-storSPUCCH-FormatX, dettaF-s$	alpha-SRS
Parameter: <i>aug.</i> See TS 36,213 [23], clause 5.1.1.1, where all corresponds to 0, all 4 corresponds to value 0.4, al05 to 5, al07 to 0.7, al08 to 0.8, al09 to 0.9 and all corresponds to 1. <i>ieitaF-PUCCH-FormatX</i> Parameter: A _{P_PUCCH} ( <i>F</i> ) for the PUCCH formats 1, 1b, 2, 2a, 2b, 3, 4, 5 and 1b with channel selection. See TS <i>i6.213</i> [23], clause 5.1.2, where deltaF-2 corresponds to 2 dB, deltaF-0 corresponds to 0 dB and so on. <i>ieitaF-PUCCH-FormatX</i> , <i>deltaF-siotSPUCCH-FormatX</i> , <i>deltaF-subsiotSPUCCH-FormatX</i> Parameter: A _{P_PUCCH} ( <i>F</i> ) for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36.213 [23], clause 5.1.2 where <i>ieitaF-PUCCH-FormatX</i> , <i>deltaF-1</i> corresponds to 0 dB and so on. In case both an A and a B configuration exist, onfiguration A is used in case SPUCCH carries s 22 HARQ-ACK bits, and B otherwise. <i>ieitaP-euclekS-Enabled</i> Parameter: K _S See TS 36.213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB]. <i>ieitaP-euclekSg3</i> Parameter: A _{PREMBLE} , M _{R3} see TS 36.213 [23], clause 5.1.2.1. Actual value = field value * 2 [dB]. <i>ieitaP-DOffsetPUCCH-FormatX</i> Parameter: A _{PRD} ( <i>P</i> ⁽⁾ ) for the PUCCH formats 1, 1a/1b, 1b with channel selection, <i>2/2a/2b</i> and 3 when two antenna ports are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, dB-1 corresponds to -4 dB, dB-2 corresponds to -2 dB. <i>ieitaTX-DOffsetPUCCH-FormatX</i> Parameter: A _{PLD} ( <i>P</i> ⁽⁾ ) for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are	<i>alpha-SubframeSet2</i> Parameter: α. See TS 36.213 [23], clause 5.1.1.1, where al0 corresponds to 0, al04 corresponds to value 0.4, al05 to
Parameter: $\Delta_{E,PUCCH}(F)$ for the PUCCH formats 1, 1b, 2, 2a, 2b, 3, 4, 5 and 1b with channel selection. See TS 46:213 [23], clause 5.1.2, where deltaF-2 corresponds to -2 dB, deltaF-0 corresponds to 0 dB and so on. <b>MetaF-PUCCH-FormatX, deltaF-slotSPUCCH-FormatX</b> , <b>deltaF-subslotSPUCCH-FormatX</b> arameter: $\Delta_{F,PUCCH}(F)$ for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36:213 [23], clause 5.1.2, where <b>leltaF-2</b> corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist, <b>onfiguration</b> A is used in case SPUCCH carries $\leq 22$ HARQ-ACK bits, and B otherwise. <b>leltaMCS-Enabled</b> <b>Parameter:</b> As See TS 36:213 [23], clause 5.1.1.1, en0 corresponds to value 0 corresponding to state "disabled". en1 <b>orresponds</b> to value 1.25 corresponding to "enabled". <b>MetaTP-OffsetPUCCH-FormatX</b> <b>Parameter:</b> $\Delta_{TREMMBLE_MRg3}$ see TS 36:213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB]. <b>MetaTP-OffsetPUCCH-FormatX</b> <b>Parameter:</b> $\Delta_{TREM}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna <b>torts</b> are configured for PUCCH transmission. See TS 36:213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTXD-OffsetPUCCH-FormatX</i> <b>Parameter:</b> $\Delta_{TRD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are <b>onfigured for SPUCCH transmission.</b> See TS 36:213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <b>MetaTD-OffsetSPUCCH-FormatX</b> <b>Parameter:</b> $\Delta_{TRD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are <b>onfigured for SPUCCH transmission.</b> See TS 36:213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 <b>orresponds</b> to -1 dB, dB-2 corresponds to -2 dB. <b>MetaTD-OffsetSPUCCH-FormatX</b> <b>Parameter:</b> $P_{0,NOMINAL_{RSRS}}(m)$ where $m$ =0. See TS 36:213 [23], claus	0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1.
lettaF-PUCCH-FormatX, deltaF-slotSPUCCH-FormatX, deltaF-subslotSPUCCH-FormatX Parameter: Δ _{F,PUCCH} ( <i>F</i> ) for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36.213 [23], clause 5.1.2 where lettaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist, onfiguration A is used in case SPUCCH carries ≤ 22 HARQ-ACK bits, and B otherwise. <b>JettaMCS-Enabled</b> Parameter: K See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en1 corresponds to value 1.25 corresponding to "enabled". <b>JettaTxD-OffsetPUCCH-FormatX</b> Parameter: Δ _{<i>TRD</i>} ( <i>F</i> ') for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, IB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-FormatX</i> Parameter: Δ _{<i>TxD</i>} ( <i>F</i> ') for the PUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, IB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-FormatX</i> Parameter: Δ _{<i>TxD</i>} ( <i>F</i> ') for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are nofigured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <b>JiterCoefficient</b> Specifiest the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <b>Do-Nominal-AperiodicSRS</b> Parameter: <i>P</i> _{0_NOMINAL_SRS.c} ( <i>m</i> ) where <i>m</i> =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>Do-Nominal-PeriodicSRS</b> Parameter: <i>P</i> _{0_NOMINAL_SRS.c} ( <i>m</i> ) where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.	Parameter: $\Delta_{\text{F_PUCCH}}(F)$ for the PUCCH formats 1, 1b, 2, 2a, 2b, 3, 4, 5 and 1b with channel selection. See TS
$\begin{aligned} & \text{JettaF-PUCCH-FormatX}, & \text{dettaF-slotSPUCCH-FormatX}, & \text{dettaF-subslotSPUCCH-FormatX} \\ & \text{Parameter: } \Delta_{\text{F,PUCCH}}(F) & \text{for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36.213 [23], clause 5.1.2 where } \\ & \text{JettaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist, \\ & \text{onfiguration A is used in case SPUCCH carries \leq 22 HARQ-ACK bits, and B otherwise. \\ & \text{JettaMCS-Enabled} \\ & \text{Jarameter: KS See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en1 \\ & \text{torresponds to value 1.25 corresponding to "enabled". \\ & \text{JettaTxD-OffsetBPUCCH-FormatX} \\ & \text{Jarameter: } \Delta_{\text{PREAMBLE}_Meg3} & \text{see TS 36.213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB]. \\ & \text{JettaTxD-OffsetDUCH-FormatX} \\ & \text{Jarameter: } \Delta_{TAD}(F') & \text{for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna horts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, \\ & \text{B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field deltaTxD-OffsetPUCCH-formatX \\ & \text{Parameter: } \Delta_{TxD}(F') & \text{for the PUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, \\ & \text{B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. \\ & \text{Jarameter: } \Delta_{TxD}(F') & \text{for the SPUCCH formatx 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, dB-1 \\ & \text{orresponds to -1 dB, dB-2 corresponds to -2 dB. \\ & \text{Jarameter: } P_{O_{CNOMINAL_SRSc}}(m) & \text{where m=1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. \\ & \text{O-Nominal-AperiodicSRS} \\ & \text{Parameter: } P_{O_{NOMINAL_SRSc}}(m) & \text{where m=1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. \\ & \text{O-Nominal-PeriodicSRS} \\ & Parameter:$	36.213 [23], clause 5.1.2, where deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on.
lettaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist, configuration A is used in case SPUCCH carries ≤ 22 HARQ-ACK bits, and B otherwise. <b>IdetaMCS-Enabled</b> 'arameter: Ks See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en1 corresponds to value 1.25 corresponding to "enabled". <b>IdetaPreambleMsg3</b> Parameter: Δ _{<i>TKD</i>} ( <i>F</i> ") for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH</i> - <i>Format</i> 1 <i>b</i> ( <i>S</i> - <i>t11</i> for the PUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH</i> - <i>Format</i> 1 <i>b</i> ( <i>S</i> - <i>t11</i> for the PCell and/or the PSCell only. <b>IdetaTxD-OffsetSPUCCH-FormatX</b> Parameter: Δ _{<i>TxD</i>} ( <i>F</i> ") for the PUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <b>IderCoefficient</b> Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], <b>iause</b> 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <b>90-Nominal-AperiodicSRS</b> Parameter: <i>P</i> _{0,NOMINAL_SRS,c} ( <i>m</i> ) where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>90-Nominal-PeriodicSRS</b> Parameter: <i>P</i> _{0,NOMINAL_SRS,c} ( <i>m</i> ) where <i>m</i> =0. See TS 36.213 [23], clause 5.1.1.1, unit dBm. <b>90-Nominal-PeriodicSRS</b> Parameter: <i>P</i> _{0,NOMINAL_SRS,c} ( <i>m</i> ) where <i>m</i> =0. See TS 36.213 [23], clause 5.1.1.	deltaF-PUCCH-FormatX, deltaF-slotSPUCCH-FormatX, deltaF-subslotSPUCCH-FormatX
configuration A is used in case SPUCCH carries $\leq$ 22 HARQ-ACK bits, and B otherwise. <b>HetaMCS-Enabled</b> "arrameter: Ks See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en1 corresponds to value 1.25 corresponding to "enabled". <b>HetaPreambleMsg3</b> "arrameter: $\Delta_{pREAMBLEMrg3}$ see TS 36.213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB]. <b>HetaTxD-OffsetPUCCH-FormatX</b> Parameter: $\Delta_{TXD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH</i> - <i>Format1bCS-r11</i> for the PCeII and/or the PSCeII only. <b>HetaTxD-OffsetSPUCCH-FormatX</b> "arameter: $\Delta_{TXD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to -0 dB, <b>HetaTxD-OffsetSPUCCH-FormatX</b> "arameter: $\Delta_{TXD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 <b>interCoefficient</b> <b>HetaFittering</b> mechanism applies as for <i>quantityConfig</i> described in TS 36.213 [23], <b>Hause 5.1.1.1</b> . The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <b>De-Nominal-AperiodicSRS</b> Parameter: $P_{O,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>De-NominalPUCCH</b> Parameter: $P_{O,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>De-NominalPUCCH</b> Parameter: $P_{O,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>De-NominalPUCCH</b> Parameter: $P_{O,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for	Parameter: $\Delta_{F_PUCCH}(F)$ for the SPUCCH formats 1, 1a, 1b, 3 and 4. See TS 36.213 [23], clause 5.1.2 where
Parameter: Ks See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". IdetaPreambleMsg3 Parameter: $\Delta_{PREAMBLE_Mag3}$ see TS 36.213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB]. IdetaTxD-OffsetPUCCH-FormatX Parameter: $\Delta_{TxD}(F^*)$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna  norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB,  B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH</i> - <i>format1bCS-r11</i> for the PCell and/or the PSCell only. IdetaTxD-OffsetPUCCH-FormatX Parameter: $\Delta_{TxD}(F^*)$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna  ports are configured for SPUCCH-FormatX Parameter: $\Delta_{TxD}(F^*)$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna  ports are configured for SPUCCH-FormatX Parameter: $\Delta_{TxD}(F^*)$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna  ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. IterCoefficient Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23],  lause 5.1.1.1. The same filtering mechanism applies as for quantityConfig described in 5.5.3.2. PArameter: $P_{0_NOMINAL_SRS,c}(m)$ where $m=0$ . See TS 36.213 [23],  clause 5.1.3.1,  unit dBm. Parameter: $P_{0_NOMINAL_SRS,c}(m)$ where $m=0$ . See TS 36.213 [23],  clause 5.1.3.1,  unit dBm. Parameter: $P_{0_NOMINAL_PUCCH}$ See TS 36.213 [23],  clause 5.1.2.1,  unit dBm. Parameter: $P_{0_NOMINAL_PUSCH}(1)$ See TS 36.213 [23],  clause 5.1.1.1,  unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if  uplink power control subframe Parameter: $P_{0_NOMINAL$	deltaF-2 corresponds to -2 dB, deltaF0 corresponds to 0 dB and so on. In case both an A and a B configuration exist configuration A is used in case SPUCCH carries ≤ 22 HARQ-ACK bits, and B otherwise.
Parameter: $\Delta_{PREAMBLE_Msg3}$ see TS 36.213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB]. <b>IdeltaTxD-OffsetPUCCH-FormatX</b> Parameter: $\Delta_{TxD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, B-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-FormatX</i> Parameter: $\Delta_{TxD}(F')$ for the PCell and/or the PSCell only. <b>IdeltaTxD-OffsetSPUCCH-FormatX</b> Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <b>IdeltaTxD-OffsetFUCCH transmission</b> . See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <b>IdeltaTxD-OffsetFicient</b> Specificient for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <b>IdeltaCoefficient</b> Specificient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <b>Do-Nominal-AperiodicSRS</b> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-NominalPUCCH</b> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-NominalPUSCH</b> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-NominalPUSCH</b> Parameter: $P_{0,NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe ets are configured by t	<i>deltaMCS-Enabled</i> Parameter: <i>Ks</i> See TS 36.213 [23], clause 5.1.1.1. en0 corresponds to value 0 corresponding to state "disabled". en corresponds to value 1.25 corresponding to "enabled".
<b>HetaTxD-OffsetPUCCH-FormatX</b> Parameter: $\Delta_{TxD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna ints are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, IB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-</i> <i>Tormat1bCS-r11</i> for the PCell and/or the PSCell only. <b>HetaTxD-OffsetSPUCCH-FormatX</b> Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 <i>corresponds</i> to -1 dB, dB-2 corresponds to -2 dB. <b>HerCoefficient</b> specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <b>Do-Nominal-AperiodicSRS</b> Parameter: $P_{O_{NOMINAL_SRS,c}(m)$ where <i>m</i> =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-Nominal-PeriodicSRS</b> Parameter: $P_{O_{NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-Nominal-PeriodicSRS</b> Parameter: $P_{O_{NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <b>DO-NominalPUCCH</b> Parameter: $P_{O_{NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe ets are configured by <i>tpc-SubframeSet</i> . <b>DO-NominalPUSCH-</b> Parameter: $P_{O_{NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe ets are configured by <i>tpc-SubframeSet</i> .	deltaPreambleMsg3
Parameter: $\Delta_{TxD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna norts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, IB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-formattbCS-r11</i> for the PCell and/or the PSCell only. <i>VeltaTxD-OffsetSPUCCH-FormatX</i> Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <i>VeltaTxD-OffsetSPUCCH-formaty</i> Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <i>VeltaTxD-OffsetIPUCCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>SO-Nominal-PeriodicSRS</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>SO-NominalPUCCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>SO-NominalPUCCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>SO-NominalPUCCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.1.1, unit dBm. <i>SO-NominalPUSCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>SO-NominalPUSCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>SO-NominalPUSCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>SO-NominalPUSCH</i> Parameter: $P_{0,NOMINAL_SRS,c}(n)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>So-No-NominalPUSCH</i>	Parameter: $\Delta_{PREAMBLE _Msg3}$ see TS 36.213 [23], clause 5.1.1.1. Actual value = field value * 2 [dB].
borts are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-FormattDcS-r11</i> for the PCell and/or the PSCell only. <i>HeltaTxD-OffsetSPUCCH-FormatX</i> Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <i>HercCoefficient</i> specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <i>Do-Nominal-AperiodicSRS</i> Parameter: $P_{0_NOMINAL_SRS,c}(m)$ where <i>m</i> =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-Nominal-PeriodicSRS</i> Parameter: $P_{0_NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-NominalPUCCH</i> Parameter: $P_{0_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>Do-NominalPUSCH</i> Parameter: $P_{0_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe Parameter: $P_{0_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe Parameter: $P_{0_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe Parameter: $P_{0_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for	deltaTxD-OffsetPUCCH-FormatX
BB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRÁN configures the field <i>deltaTxD-OffsetPUCCH-</i> <i>CormattbCS-r11</i> for the PCell and/or the PSCell only. <i>MeltaTxD-OffsetSPUCCH-FormatX</i> Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <i>InterCoefficient</i> Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], <i>lause</i> 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <i>DeNominal-AperiodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where <i>m</i> =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>DeNominal-PeriodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>DeNominalPUCCH</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>DeNominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>DeNominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUCCH}$ (1) See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe tets are configured by <i>tpc-SubframeSet</i> . <i>DeNominalPUSCH-SubframeSet</i> Parameter: $P_{O_NOMINAL_PUSCH}$ (1). See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe tets are configured by <i>tpc-SubframeSet</i> . <i>DeNominalPUSCH-SubframeSet</i> .	Parameter: $\Delta_{TxD}(F')$ for the PUCCH formats 1, 1a/1b, 1b with channel selection, 2/2a/2b and 3 when two antenna
$Parameter: \Delta_{TxD}(F') \text{ for the SPUCCH-FormatX}$ Parameter: $\Delta_{TxD}(F')$ for the SPUCCH formats 1, 1a/1b, 1b with channel selection and 3 when two antenna ports are configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <i>ilterCoefficient</i> pspecifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <i>Do-Nominal-AperiodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m$ =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-Nominal-PeriodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m$ =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-NominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUSCH}$ (1) See TS 36.213 [23], clause 5.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe ters are configured by <i>tpc-SubframeSet</i> . <i>Do-NominalPUSCH-SubframeSet</i> . <i>Do-NominalPUSCH Co_NOMINAL_PUSCH</i> (1). See TS 36.213 [23], clause 5.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe ters are configured by <i>tpc-SubframeSet</i> . <i>Do-NominalPUSCH Co_NOMINAL_PUSCH</i> (1). See TS 36.213 [23], clause 5.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe ters are configured by <i>tpc-SubframeSet</i> . <i>Do-NominalPUSCH-SubframeSet</i> . <i>Do-Nomina</i>	ports are configured for PUCCH transmission. See TS 36.213 [23], clause 5.1.2.1, where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. EUTRAN configures the field <i>deltaTxD-OffsetPUCCH-Format1bCS-r11</i> for the PCell and/or the PSCell only.
configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1 corresponds to -1 dB, dB-2 corresponds to -2 dB. <i>ilterCoefficient</i> Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], clause 5.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <i>Do-Nominal-AperiodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where <i>m</i> =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-Nominal-PeriodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-NominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>Do-NominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUCCH}$ (1) See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <i>Do-NominalPUSCH-SubframeSet</i> Parameter: $P_{O_NOMINAL_PUSCH}$ (1). See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <i>Do-NominalPUSCH-SubframeSet</i> Parameter: $P_{O_NOMINAL_PUSCH}$ (1). See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe tests are configured by <i>tpc-SubframeSet</i> .	deltaTxD-OffsetSPUCCH-FormatX
illerCoefficient         Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23], lause 5.1.1.1. The same filtering mechanism applies as for <i>quantityConfig</i> described in 5.5.3.2. <i>Do-Nominal-AperiodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m=1$ . See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-Nominal-PeriodicSRS</i> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m=0$ . See TS 36.213 [23], clause 5.1.3.1, unit dBm. <i>Do-NominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>Do-NominalPUCCH</i> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <i>Do-NominalPUSCH</i> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-         versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <i>Do-NominalPUSCH-SubframeSet2</i> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-         versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	configured for SPUCCH transmission. See TS 36.213 [23], clause 5.1.2.1 where dB0 corresponds to 0 dB, dB-1
<b>DO-Nominal-AperiodicSRS</b> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m$ =1. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-Nominal-PeriodicSRS</b> Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m$ =0. See TS 36.213 [23], clause 5.1.3.1, unit dBm. <b>DO-NominalPUCCH</b> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <b>DO-NominalPUSCH</b> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-         Parameter: $P_{O_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-         Persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe         Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-         Persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe         Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-         Persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe         Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . This field applies for uplink power control subframe set 2 if uplink power control subframe	<i>filterCoefficient</i> Specifies the filtering coefficient for RSRP measurements used to calculate path loss, as specified in TS 36.213 [23]
$P_{\text{O}-\text{Nominal-PeriodicSRS}} \\ P_{\text{O}_{\text{NOMINAL}_SRS,c}}(m) \text{ where } m=0. \text{ See TS 36.213 [23], clause5.1.3.1, unit dBm.} \\ P_{\text{O}_{\text{NOMINAL}_PUCCH}} \\ P_{\text{O}_{\text{NOMINAL}_PUCCH}} \\ See TS 36.213 [23], clause 5.1.2.1, unit dBm. \\ P_{\text{O}_{\text{NOMINAL}_PUCCH}} \\ P_{\text{O}_{\text{NOMINAL}_PUCCH}}(1) \\ See TS 36.213 [23], clause 5.1.1.1, unit dBm. \\ This field is applicable for non-persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by tpc-SubframeSet. \\ P_{\text{O}_{\text{NOMINAL}_PUSCH}}(1) \\ See TS 36.213 [23], clause 5.1.1.1, unit dBm. \\ This field is applicable for non-persistent scheduling only. \\ P_{\text{P}} arameter: \\ P_{\text{O}_{\text{NOMINAL}_PUSCH}}(1) \\ See TS 36.213 [23], clause 5.1.1.1, unit dBm. \\ This field is applicable for non-persistent scheduling only. \\ This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by tpc-SubframeSet. \\ P_{\text{P}} arameter: \\ P_{\text{O}_{\text{NOMINAL}_PUSCH}}(1) \\ See TS 36.213 [23], clause 5.1.1.1, unit dBm. \\ This field is applicable for non-persistent scheduling only. \\ This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by tpc-SubframeSet. \\ P_{\text{P}} arameter: \\ P_{\text{O}_{\text{NOMINAL}_{\text{P}}} P_{\text{O}_{\text{N}}}(1) \\ See TS 36.213 [23], clause 5.1.1.1, unit dBm. \\ This field is applicable for non-persistent scheduling only. \\ This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by tpc-SubframeSet. \\ P_{\text{O}_{\text{N}}} are configured by tpc-SubframeS$	po-Nominal-AperiodicSRS
Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m$ =0. See TS 36.213 [23], clause5.1.3.1, unit dBm. <b>DO-NominalPUCCH</b> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <b>DO-NominalPUSCH</b> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <b>DO-NominalPUSCH-SubframeSet</b> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	Parameter: $P_{O_NOMINAL_SRS,c}(m)$ where $m=1$ . See TS 36.213 [23], clause 5.1.3.1, unit dBm.
<b>DO-NominalPUCCH</b> Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <b>DO-NominalPUSCH</b> Parameter: $P_{O_NOMINAL_PUSCH}$ (1) See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe set. <b>DO-NominalPUSCH</b> Parameter: $P_{O_NOMINAL_PUSCH}$ (1) See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe Set. <b>DO-NominalPUSCH-SubframeSet2</b> Parameter: $P_{O_NOMINAL_PUSCH}$ (1) . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	•
Parameter: $P_{O_NOMINAL_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1, unit dBm. <b>DO-NominalPUSCH</b> Parameter: $P_{O_NOMINAL_PUSCH}$ (1) See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <b>DO-NominalPUSCH-SubframeSet2</b> Parameter: $P_{O_NOMINAL_PUSCH}$ (1). See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	
Parameter: $P_{O_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <b>D0-NominalPUSCH-SubframeSet2</b> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- versistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	Parameter: P _{O_NOMINAL_PUCCH} See TS 36.213 [23], clause 5.1.2.1, unit dBm.
persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <b>DO-NominalPUSCH-SubframeSet2</b> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	p0-NominalPUSCH
tets are configured by <i>tpc-SubframeSet</i> . <b>D0-NominalPUSCH-SubframeSet2</b> Parameter: $P_{O_NOMINAL_PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non- persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	Parameter: $P_{O_NOMINAL_PUSCH}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-
persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	persistent scheduling only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . <b>p0-NominalPUSCH-SubframeSet2</b>
persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	Parameter: $P_{ m O NOMINAL PUSCH}(1)$ . See TS 36.213 [23], clause 5.1.1.1, unit dBm. This field is applicable for non-
	persistent scheduling only. This field applies for uplink power control subframe set 2 if uplink power control subframe
	p0-UE-AperiodicSRS
Parameter: $P_{O, \text{UE SRS},c}(m)$ where m=1. See TS 36.213 [23], clause 5.1.3.1, unit dB.	Parameter: $P_{O \text{ UE SRS,c}}(m)$ where m=1. See TS 36.213 [23], clause 5.1.3.1, unit dB.

UplinkPowerControl field descriptions	
p0-UE-PeriodicSRS	
Parameter: $P_{O_{UE}SRS,c}(m)$ where <i>m</i> =0. See TS 36.213 [23], clause 5.1.3.1, unit dB.	
p0-UE-PUCCH	
Parameter: $P_{ m O_UE_PUCCH}$ See TS 36.213 [23], clause 5.1.2.1. Unit dB	
p0-UE-PUSCH	
Parameter: $P_{O_{UE_PUSCH}}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for non-persistent	
scheduling, only. This field applies for uplink power control subframe set 1 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> . If <i>p0-UE-PUSCH-r15</i> is included, the UE ignores <i>p0-UE-PUSCH</i> (i.e., without suffix	
p0-UE-PUSCH-SubframeSet2	
Parameter: $P_{O_{UE_PUSCH}}(1)$ See TS 36.213 [23], clause 5.1.1.1, unit dB. This field is applicable for non-persistent	
scheduling, only. This field applies for uplink power control subframe set 2 if uplink power control subframe sets are configured by <i>tpc-SubframeSet</i> .	
pathlossReferenceLinking	
Indicates whether the UE shall apply as pathloss reference either the downlink of the PCell or of the SCell that corresponds with this uplink (i.e. according to the <i>cellIdentification</i> within the field <i>sCellToAddMod</i> ). For SCells part of an STAG E-UTRAN sets the value to sCell.	of
pSRS-Offset, pSRS-OffsetAp	
Parameter: $P_{SRS_OFFSET}$ for periodic and aperiodic sounding reference signal transmission repectively. See TS 36.21 [23], clause 5.1.3.1. For Ks=1.25, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value – 3. For Ks=0, the actual parameter value is <i>pSRS-Offset</i> value value is <i>pSRS</i>	3
If <i>pSRS-Offset-v1130</i> is included, the UE ignores <i>pSRS-Offset</i> (i.e., without suffix). Likewise, if <i>pSRS-OffsetAp-v11</i> is included, the UE ignores <i>pSRS-OffsetAp-r10</i> . For <i>Ks</i> =0, E-UTRAN does not set values larger than 26.	30
tpc-SubframeSet	
Indicates the uplink subframes (including UpPTS in special subframes) of the uplink power control subframe sets. Value 0 means the subframe belongs to uplink power control subframe set 1, and value 1 means the subframe belongs to uplink power control subframe set 2.	
uplinkPower-CSIPayload	
Indicates whether the UE shall derive BPRE based on the actual value of O_CQI for slot/subslot-PUSCH. If not present, the largest value of O_CQI across all RI values shall be used for the derivation of BPRE for slot/subslot-	

PUSCH.

# WLAN-Id-List

The IE WLAN-Id-List is used to list WLAN(s) for configuration of WLAN measurements and WLAN mobility set.

-- ASN1START

WLAN-Id-List-r13 ::=

SEQUENCE (SIZE (1..maxWLAN-Id-r13)) OF WLAN-Identifiers-r12

-- ASN1STOP

-- ASN1START

# WLAN-MobilityConfig

The IE WLAN-MobilityConfig is used for configuration of WLAN mobility set and WLAN Status Reporting. E-UTRAN configures at least one WLAN identifier in the WLAN-MobilityConfig.

WLAN-MobilityConfig-r13 ::=	SEQUENCE {		
wlan-ToReleaseList-r13	WLAN-Id-List-r13	OPTIONAL,	Need ON
wlan-ToAddList-r13	WLAN-Id-List-r13	OPTIONAL,	Need ON
associationTimer-r13	ENUMERATED {s10, s30,		
	s60, s120, s240}	OPTIONAL,	Need OR
successReportRequested-r13	ENUMERATED {true}	OPTIONAL,	Need OR
· · · · ,			
[[ wlan-SuspendConfig-r14	WLAN-SuspendConfig-r14	OPTIONAL	Need ON
]]			
}			

-- ASN1STOP

#### WLAN-MobilityConfig field descriptions associationTimer Indicates the maximum time for connection to WLAN before connection failure reporting is initiated. Value s10 means 10 seconds, value s30 means 30 seconds and so on. E-UTRAN includes association Timer only upon change in WLAN mobility set, Iwa-WT-Counter or Iwip-Counter. successReportRequested Indicates whether the UE shall report successful connection to WLAN. Applicable to LWA and LWIP. wlan-ToAddList Indicates the WLAN identifiers to be added to the WLAN mobility set. wlan-ToReleaseList Indicates the WLAN identifiers to be removed from the WLAN mobility set.

WUS-Config

The IE WUS-Config is used to specify the WUS configuration. For the UEs supporting WUS, E-UTRAN uses WUS to indicate that the UE shall attempt to receive paging in that cell, see TS 36.304 [4].

### WUS-Config information element

ASN1START	
<pre>WUS-Config-r15 ::=     maxDurationFactor-r15     numPOs-r15     freqLocation-r15     timeOffsetDRX-r15     timeOffset-eDRX-Short-r15     timeOffset-eDRX-Long-r15 }</pre>	<pre>SEQUENCE {     ENUMERATED {one32th, one16th, one8th, one4th},     ENUMERATED {n1, n2, n4, spare1} DEFAULT n1,     ENUMERATED {n0, n2, n4, spare1},     ENUMERATED {ms40, ms80, ms160, ms240},     ENUMERATED {ms40, ms80, ms160, ms240},     ENUMERATED {ms1000, ms2000} OPTIONAL Need OP</pre>
WUS-Config-v1560 ::= powerBoost-r15 }	SEQUENCE { ENUMERATED {dB0, dB1dot8, dB3, dB4dot8}
ASN1STOP	

WUS-Config field descriptions	
freqLocation	
Frequency location of WUS within paging narrowband for BL UEs and UEs in CE. Value n0 corresponds to WUS in th	
1st and 2nd PRB, value n2 represents the 3rd and 4th PRB, and value n4 represents the 5th and 6th PRB.	
maxDurationFactor	
Maximum WUS duration, expressed as a ratio of Rmax associated with Type 1-CSS, see TS 36.211 [21]. Value	
one32th corresponds to Rmax * 1/32, value one16th corresponds to Rmax * 1/16 and so on.	
The value L _{MWUSmax} in TS 36.213 [23] considered by the UE is : maxDuration = Max (signalled value * Rmax, 1) where	
Rmax is the value of mpdcch-NumRepetitionPaging for the carrier.	
numPOs	
Number of consecutive Paging Occasions (PO) mapped to one WUS, applicable to UEs configured to use extended	
DRX, see TS 36.304 [4]. Value n1 corresponds to 1 PO, value n2 corresponds to 2 POs and so on.	
powerBoost	
Power offset of WUS relative to CRS in dB, see TS 36.213 [23] clause 5.2. Value db0 corresponds to 0dB, value	
db1dot8 corresponds to 1.8dB, and so on.	
timeOffsetDRX	
Minimum time gap in milliseconds from the end of the configured maximum WUS duration to the first associated PO,	
see TS 36.211 [21]. Value ms40 corresponds to 40 ms, value ms80 corresponds to 80 ms and so on.	
timeOffset-eDRX-Short	
When eDRX is used, the short non-zero gap in milliseconds from the end of the configured maximum WUS duration to	
the associated PO, see TS 36.211 [21]. Value ms40 corresponds to 40 ms, value ms80 corresponds to 80 ms and so	
on.	
E-UTRAN configures timeOffset-eDRX-Short to a value longer than or equal to timeOffsetDRX.	
timeOffset-eDRX-Long	
When eDRX is used, the long non-zero gap in milliseconds from the end of the configured maximum WUS duration to	
the associated PO, see TS 36.211 [21]. Value <i>ms1000</i> corresponds to 1000 ms and value <i>ms2000</i> corresponds to	
2000 ms.	
If the field is absent, UE uses timeOffset-eDRX-Short for monitoring WUS.	

# 6.3.3 Security control information elements

# – NextHopChainingCount

The IE *NextHopChainingCount* is used to update the K_{eNB} key and corresponds to parameter NCC: See TS 33.401 [32], clause 7.2.8.4.

#### NextHopChainingCount information element

```
-- ASN1START
NextHopChainingCount ::= INTEGER (0..7)
-- ASN1STOP
```

SecurityAlgorithmConfig

The IE *SecurityAlgorithmConfig* is used to configure AS integrity protection algorithm (SRBs) and AS ciphering algorithm (SRBs and DRBs). For RNs, the IE *SecurityAlgorithmConfig* is also used to configure AS integrity protection algorithm for DRBs between the RN and the E-UTRAN.

## SecurityAlgorithmConfig information element

```
SecurityAlgorithmConfig ::= SEQUENCE {
    cipheringAlgorithm
    integrityProtAlgorithm
}
CipheringAlgorithm-r12 ::= ENUMERATED {
    eia0-v920, eia1, eia2, eia3-v1130, spare4, spare3,
    spare2, spare1, ...}
```

-- ASN1STOP

-- ASN1START

#### SecurityAlgorithmConfig field descriptions

*cipheringAlgorithm* Indicates the ciphering algorithm to be used for SRBs and DRBs, as specified in TS 33.401 [32], clause 5.1.3.2. *integrityProtAlgorithm* Indicates the integrity protection algorithm to be used for SRBs, as specified in TS 33.401 [32], clause 5.1.4.2. For RNs, also indicates the integrity protection algorithm to be used for integrity protection-enabled DRB(s).

- ShortMAC-I

SHOULINAC-I

The IE *ShortMAC-I* is used to identify and verify the UE at RRC connection re-establishment. The 16 least significant bits of the MAC-I calculated using the security configuration of the source PCell, as specified in 5.3.7.4.

### ShortMAC-I information element

ASN1START	
ShortMAC-I ::=	BIT STRING (SIZE (16))
ASN1STOP	

### 6.3.4 Mobility control information elements

### AdditionalSpectrumEmission

If an extension is signalled using the extended value range (as defined by IE *AdditionalSpectrumEmission-v10l0*), the corresponding original field, using the value range as defined by IE *AdditionalSpectrumEmission* i.e. without suffix) shall be set to value 32, if signalled. UE supporting an LTE band assigned NS values larger than 32 as defined in TS 36.101 [42], clause 6.2.4, needs to support extension signaling (as defined by IE *AdditionalSpectrumEmission-v10l0*).

### AdditionalSpectrumEmission information element

```
-- ASN1START
AdditionalSpectrumEmission ::= INTEGER (1..32)
AdditionalSpectrumEmission-v1010 ::= INTEGER (33..288)
-- ASN1STOP
```

### _

### AdditionalSpectrumEmissionNR

The IE *AdditionalSpectrumEmissionNR* is used to indicate NR emission requirements to be fulfilled by the UE (see TS 38.101-1 [85], clause 6.5.3.3, and TS 38.101-2 [100], clause 6.5.3.2 and TS 38.101-3 [101], clause 6.5B.2)

### AdditionalSpectrumEmissionNR information element

```
-- ASN1START
AdditionalSpectrumEmissionNR-r15 ::= INTEGER (0..7)
-- ASN1STOP
```

### - ARFCN-ValueCDMA2000

The IE ARFCN-ValueCDMA2000 used to indicate the CDMA2000 carrier frequency within a CDMA2000 band, see C.S0002 [12].

### ARFCN-ValueCDMA2000 information element

ASN1START			
ARFCN-ValueCDMA2000	::=	INTEGER	(02047)
ASN1STOP			

### - ARFCN-ValueEUTRA

The IE *ARFCN-ValueEUTRA* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) E-UTRA carrier frequency, as defined in TS 36.101 [42]. If an extension is signalled using the extended value range (as defined by IE *ARFCN-ValueEUTRA-v9e0*), the UE shall only consider this extension (and hence ignore the corresponding original field, using the value range as defined by IE *ARFCN-ValueEUTRA* i.e. without suffix, if signalled). In dedicated signalling, E-UTRAN only provides an EARFCN corresponding to an E-UTRA band supported by the UE.

### ARFCN-ValueEUTRA information element

ASN1START		
ARFCN-ValueEUTRA ::=	INTEGER	(0maxEARFCN)
ARFCN-ValueEUTRA-v9e0 ::=	INTEGER	(maxEARFCN-Plus1maxEARFCN2)
ARFCN-ValueEUTRA-r9 ::=	INTEGER	(0maxEARFCN2)

-- ASN1STOP

NOTE: For fields using the original value range, as defined by IE *ARFCN-ValueEUTRA* i.e. without suffix, value *maxEARFCN* indicates that the E-UTRA carrier frequency is indicated by means of an extension. In such a case, UEs not supporting the extension consider the field to be set to a not supported value.

### ARFCN-ValueGERAN

The IE *ARFCN-ValueGERAN* is used to specify the ARFCN value applicable for a GERAN BCCH carrier frequency, see TS 45.005 [20].

### ARFCN-ValueGERAN information element

ASN1START	
ARFCN-ValueGERAN ::=	INTEGER (01023)
ASN1STOP	

– ARFCN-ValueNR

The IE *ARFCN-ValueNR* is used to indicate the ARFCN applicable for a downlink, uplink or bi-directional (TDD) NR carrier frequency, as defined in TS 38.101 [85].

### ARFCN-ValueNR information element

ARFCN-ValueNR-r15 ::=

INTEGER (0.. 3279165)

-- ASN1STOP

-- ASN1START

### - ARFCN-ValueUTRA

The IE *ARFCN-ValueUTRA* is used to indicate the ARFCN applicable for a downlink (Nd, FDD) or bi-directional (Nt, TDD) UTRA carrier frequency, as defined in TS 25.331 [19].

### ARFCN-ValueUTRA information element

-- ASN1START

ARFCN-ValueUTRA ::=

INTEGER (0..16383)

-- ASN1STOP

-- ASN1START

### – BandclassCDMA2000

The IE *BandclassCDMA2000* is used to define the CDMA2000 band in which the CDMA2000 carrier frequency can be found, as defined in C.S0057 [24], table 1.5-1.

### BandclassCDMA2000 information element

BandclassCDMA2000 ::=	ENUMERATED {     bc0, bc1, bc2, bc3, bc4, bc5, bc6, bc7, bc8,     bc9, bc10, bc11, bc12, bc13, bc14, bc15, bc16,     bc17, bc18-v9a0, bc19-v9a0, bc20-v9a0, bc21-v9a0,
	<pre>spare10, spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1,}</pre>

-- ASN1STOP

### – BandIndicatorGERAN

The IE *BandIndicatorGERAN* indicates how to interpret an associated GERAN carrier ARFCN, see TS 45.005 [20]. More specifically, the IE indicates the GERAN frequency band in case the ARFCN value can concern either a DCS 1800 or a PCS 1900 carrier frequency. For ARFCN values not associated with one of these bands, the indicator has no meaning.

### BandIndicatorGERAN information element

ASN1START			
BandIndicatorGERAN ::=	ENUMERATED	{dcs1800,	pcs1900}
ASN1STOP			



### CarrierFreqCDMA2000

The IE CarrierFreqCDMA2000 used to provide the CDMA2000 carrier information.

### CarrierFreqCDMA2000 information element

```
-- ASN1START
```

```
CarrierFreqCDMA2000 ::=
bandClass
arfcn
}
```

SEQUENCE { BandclassCDMA2000, ARFCN-ValueCDMA2000

```
-- ASN1STOP
```

### - CarrierFreqGERAN

The IE CarrierFreqGERAN is used to provide an unambiguous carrier frequency description of a GERAN cell.

### CarrierFreqGERAN information element

```
-- ASN1START
CarrierFreqGERAN ::= SEQUENCE {
arfcn ARFCN-ValueGERAN,
bandIndicator BandIndicatorGERAN
}
-- ASN1STOP
```

### CarrierFreqGERAN field descriptions

```
GERAN ARFCN of BCCH carrier.
```

bandIndicator

arfcn

Indicates how to interpret the ARFCN of the BCCH carrier.

### CarrierFreqsGERAN

The IE *CarrierFreqListGERAN* is used to provide one or more GERAN ARFCN values, as defined in TS 45.005 [43], which represents a list of GERAN BCCH carrier frequencies.

### CarrierFreqsGERAN information element

-- ASN1START

CarrierFreqsGERAN ::= SEQ	DUENCE {	
startingARFCN	ARFCN-ValueGERAN,	
bandIndicator	BandIndicatorGERAN,	
followingARFCNs	CHOICE {	
explicitListOfARFCNs	ExplicitListOfARFCNs,	
equallySpacedARFCNs	SEQUENCE {	
arfcn-Spacing	INTEGER (18),	
numberOfFollowingARFCNs	INTEGER (031)	
},		
variableBitMapOfARFCNs	OCTET STRING (SIZE (116))	
}		
}		
ExplicitListOfARFCNs ::=	SEQUENCE (SIZE (031)) OF ARFCN-ValueGERAN	

CarrierFreqsGERAN field descriptions	
arfcn-Spacing	
Space, d, between a set of equally spaced ARFCN values.	
bandIndicator	
Indicates how to interpret the ARFCN of the BCCH carrier.	
explicitListOfARFCNs	
The remaining ARFCN values in the set are explicitly listed one by one.	
followingARFCNs	
Field containing a representation of the remaining ARFCN values in the set.	
numberOfFollowingARFCNs	
The number, n, of the remaining equally spaced ARFCN values in the set. The complete	e set of (n+1) ARFCN values is
defined as: {s, ((s + d) mod 1024), ((s + 2*d) mod 1024) ((s + n*d) mod 1024)}.	
startingARFCN	
The first ARFCN value, s, in the set.	
variableBitMapOfARFCNs	
Bitmap field representing the remaining ARFCN values in the set. The leading bit of the	
corresponds to the ARFCN = $((s + 1) \mod 1024)$ , the next bit to the ARFCN = $((s + 2) \mod 1024)$	
bitmap consists of N octets, the trailing bit of octet N corresponds to ARFCN = ((s + 8*N)	
set of ARFCN values consists of ARFCN = s and the ARFCN values, where the corresp	onding bit in the bitmap is set
to "1".	

### CarrierFreqListMBMS

The IE *CarrierFreqListMBMS* is used to indicate the E-UTRA ARFCN values of the one or more MBMS frequencies the UE is interested to receive.

### CarrierFreqListMBMS information element

ASN1START		
CarrierFreqListMBMS-r11 ::=	SEQUENCE (SIZE (1maxFreqMBMS-r11)) OF ARFCN-ValueEUTRA-r9	
ASN1STOP		

### – CDMA2000-Type

The IE CDMA2000-Type is used to describe the type of CDMA2000 network.

### CDMA2000-Type information element

-- ASN1START

_

CDMA2000-Type	:	:	=	
---------------	---	---	---	--

ENUMERATED {typelXRTT, typeHRPD}

-- ASN1STOP

### CellIdentity

The IE CellIdentity is used to unambiguously identify a cell within a PLMN.

### **CellIdentity** information element

ASN1START	
CellIdentity ::=	BIT STRING (SIZE (28))
ASN1STOP	

### – CellIndexList

The IE CellIndexList concerns a list of cell indices, which may be used for different purposes.

### CellIndexList information element

ASN1START	
CellIndexList ::=	SEQUENCE (SIZE (1maxCellMeas)) OF CellIndex
CellIndex ::=	INTEGER (1maxCellMeas)
ASN1STOP	

### CellReselectionPriority

The IE *CellReselectionPriority* concerns the absolute priority of the concerned carrier frequency/ set of frequencies (GERAN)/ bandclass (CDMA2000), as used by the cell reselection procedure. Corresponds with parameter "priority" in TS 36.304 [4]. Value 0 means: lowest priority. The UE behaviour for the case the field is absent, if applicable, is specified in TS 36.304 [4].

### CellReselectionPriority information element

ASN1START	
CellReselectionPriority ::=	INTEGER (07)
ASN1STOP	

### - CellSelectionInfoCE

The IE *CellSelectionInfoCE* contains cell selection information for CE. The *q*-*RxLevMinCE* corresponds to parameter  $Q_{rxlevmin_CE}$  in TS 36.304 [4]. The *q*-*QualMinRSRQ-CE* corresponds to parameter  $Q_{qualmin_CE}$  in TS 36.304 [4]. If *q*-*QualMinRSRQ-CE* is not present, the UE applies the (default) value of negative infinity for  $Q_{qualmin}$ .

### CellSelectionInfoCE information element

```
-- ASN1START
CellSelectionInfoCE-r13 ::= SEQUENCE {
    q-RxLevMinCE-r13 Q-RxLevMin,
    q-QualMinRSRQ-CE-r13 Q-QualMin-r9 OPTIONAL -- Need OR
}
CellSelectionInfoCE-v1530 ::= SEQUENCE {
    powerClass14dBm-Offset-r15 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12}
}
-- ASN1STOP
```

### CellSelectionInfoCE field descriptions

### powerClass14dBm-Offset

-- ASN1START

Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting *powerClass-14dBm*. Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. E-UTRAN configures this field only if *cellSelectionInfoCE-r13* is configured. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4].

### CellSelectionInfoCE1

The IE *CellSelectionInfoCE1* contains cell selection information for BL UEs or UEs in CE supporting CE Mode B. The *q*-*RxLevMinCE1* corresponds to parameter  $Q_{rxlevmin_CE1}$  in TS 36.304 [4]. If *delta-RxLevMinCE1* is not included, actual value  $Q_{rxlevmin_CE1} = q$ -*RxLevMinCE1* * 2 [dBm]. If *delta-RxLevMinCE1* is included, the actual value  $Q_{rxlevmin_CE1} = (q$ -*RxLevMinCE1* + *delta-RxLevMinCE1*) * 2 [dBm]. The *q*-*QualMinRSRQ-CE1* corresponds to parameter  $Q_{qualmin_CE1}$  in TS 36.304 [4]. If *q*-*QualMinRSRQ-CE1* is not present, the UE applies the (default) value of negative infinity for  $Q_{qualmin}$ .

### CellSelectionInfoCE1 information element

### CellReselectionSubPriority

The IE *CellReselectionSubPriority* indicates a fractional value to be added to the value of cellReselectionPriority to obtain the absolute priority of the concerned carrier frequency for E-UTRA.-Value oDot2 corresponds to 0.2, oDot4 corresponds to 0.4 and so on.

### CellReselectionSubPriority information element

```
-- ASN1START
CellReselectionSubPriority-r13 ::= ENUMERATED {oDot2, oDot4, oDot6, oDot8}
-- ASN1STOP
```

### _

-- ASN1START

### CSFB-RegistrationParam1XRTT

The IE *CSFB-RegistrationParam1XRTT* is used to indicate whether or not the UE shall perform a CDMA2000 1xRTT pre-registration if the UE does not have a valid / current pre-registration.

CSFB-RegistrationParam1XRTT ::=	SEQUENCE {
sid	BIT STRING (SIZE (15)),
nid	BIT STRING (SIZE (16)),
multipleSID	BOOLEAN,
multipleNID	BOOLEAN,
homeReg	BOOLEAN,
foreignSIDReg	BOOLEAN,
foreignNIDReg	BOOLEAN,
parameterReg	BOOLEAN,
powerUpReg	BOOLEAN,
registrationPeriod	BIT STRING (SIZE (7)),
registrationZone	BIT STRING (SIZE (12)),
totalZone	BIT STRING (SIZE (3)),
zoneTimer	BIT STRING (SIZE (3))
}	

CSFB-RegistrationParam1XRTT-v920	::=	SEQUENCE {	
powerDownReg-r9		ENUMERATED	{true}
}			

-- ASN1STOP

CSFB-RegistrationParam1XRTT field descriptions
foreignNIDReg
The CDMA2000 1xRTT NID roamer registration indicator.
foreignSIDReg
The CDMA2000 1xRTT SID roamer registration indicator.
homeReg
The CDMA2000 1xRTT Home registration indicator.
multipleNID
The CDMA2000 1xRTT Multiple NID storage indicator.
multipleSID
The CDMA2000 1xRTT Multiple SID storage indicator.
nid
Used along with the sid as a pair to control when the UE should Register or Re-Register with the CDMA2000 1xRTT
network.
parameterReg
The CDMA2000 1xRTT Parameter-change registration indicator.
powerDownReg
The CDMA2000 1xRTT Power-down registration indicator. If set to TRUE, the UE that has a valid / current
CDMA2000 1xRTT pre-registration will perform a CDMA2000 1xRTT power down registration when it is switched of
powerUpReg
The CDMA2000 1xRTT Power-up registration indicator.
The CDMA2000 1xRTT Registration period.
The CDMA2000 1xRTT Registration zone.
sid
Used along with the nid as a pair to control when the UE should Register or Re-Register with the CDMA2000 1xRTT
network.
totalZone
The CDMA2000 1xRTT Number of registration zones to be retained.
zoneTimer
The CDMA2000 1xRTT Zone timer length.

### CellGlobalIdEUTRA

The IE *CellGlobalIdEUTRA* specifies the Evolved Cell Global Identifier (ECGI), the globally unique identity of a cell in E-UTRA.

### CellGlobalIdEUTRA information element

ASN1START	
<pre>CellGlobalIdEUTRA :     plmn-Identity     cellIdentity }</pre>	:=
ASN1STOP	

SEQUENCE { PLMN-Identity, CellIdentity

# CellGloballdEUTRA field descriptions

 cellIdentity

 Identity of the cell within the context of the PLMN.

 pImn-Identity

 Identifies the PLMN of the cell as given by the first PLMN entry in the pImn-IdentityList in

 SystemInformationBlockType1.

### CellGloballdUTRA

The IE CellGlobalIdUTRA specifies the global UTRAN Cell Identifier, the globally unique identity of a cell in UTRA.

### CellGloballdUTRA information element

PLMN-Identity,

BIT STRING (SIZE (28))

SEQUENCE {

```
-- ASN1START
```

```
CellGlobalIdUTRA ::=
    plmn-Identity
    cellIdentity
}
```

-- ASN1STOP

## CellGloballdUTRA field descriptions

*cellIdentity* UTRA Cell Identifier which is unique within the context of the identified PLMN as defined in TS 25.331 [19]. *pImn-Identity* Identifies the PLMN of the cell as given by the common PLMN broadcast in the MIB, as defined in TS 25.331 [19].

### CellGloballdGERAN

The IE *CellGlobalIdGERAN* specifies the Cell Global Identification (CGI), the globally unique identity of a cell in GERAN.

SEQUENCE {

### CellGloballdGERAN information element

PLMN-Identity,

BIT STRING (SIZE (16))

BIT STRING (SIZE (16)),

```
CellGlobalIdGERAN ::=
plmn-Identity
locationAreaCode
cellIdentity
}
```

```
-- ASN1STOP
```

-- ASN1START

 CellGloballdGERAN field descriptions

 cellIdentity

 Cell Identifier which is unique within the context of the GERAN location area as defined in TS 23.003 [27].

 locationAreaCode

 A fixed length code identifying the location area within a PLMN as defined in TS 23.003 [27].

 pImn-Identity

 Identifies the PLMN of the cell, as defined in TS 23.003 [27].

### – CellGloballdCDMA2000

The IE *CellGlobalIdCDMA2000* specifies the Cell Global Identification (CGI), the globally unique identity of a cell in CDMA2000.

### CellGlobalIdCDMA2000 information element

```
-- ASN1START
CellGlobalIdCDMA2000 ::= CHOICE {
    cellGlobalId1XRTT BIT STRING (SIZE (47)),
    cellGlobalIdHRPD BIT STRING (SIZE (128))
}
-- ASN1STOP
```

### CellSelectionInfoNFreq

The IE *CellSelectionInfoNFreq* includes the parameters used for cell selection on a neighbouring frequency, see TS 36.304 [4].

### CellSelectionInfoNFreq information element

```
-- ASN1START
CellSelectionInfoNFreq-r13 ::= SEQUENCE {
    -- Cell selection information as in SIB1
                     Q-RxLevMin,
    q-RxLevMin-r13
   q-RxLevMinOffset
                                       INTEGER (1..8)
                                                                OPTIONAL,
                                                                            -- Need OP
     - Cell re-selection information as in SIB3
                                        ENUMERATED {
   q-Hyst-r13
                                            dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,
                                            dB12, dB14, dB16, dB18, dB20, dB22, dB24},
   q-RxLevMinReselection-r13
t-ReselectionEUTRA-r13
                                       Q-RxLevMin,
                                        T-Reselection
}
```

```
-- ASN1STOP
```

```
– CSG-Identity
```

The IE CSG-Identity is used to identify a Closed Subscriber Group.

### CSG-Identity information element

```
-- ASN1START
CSG-Identity ::= BIT STRING (SIZE (27))
-- ASN1STOP
```

### FreqBandIndicator

The IE *FreqBandIndicator* indicates the E-UTRA operating band as defined in TS 36.101 [42], table 5.5-1. If an extension is signalled using the extended value range (as defined by IE *FreqBandIndicator-v9e0*), the UE shall only consider this extension (and hence ignore the corresponding original field, using the value range as defined by IE *FreqBandIndicator* i.e. without suffix, if signalled).

### FreqBandIndicator information element

ASN1START		
FreqBandIndicator ::=	INTEGER (	(1maxFBI)
FreqBandIndicator-v9e0 ::=	INTEGER (	(maxFBI-Plus1maxFBI2)
FreqBandIndicator-r11 ::=	INTEGER (	(1maxFBI2)
ASN1STOP		

NOTE: For fields using the original value range, as defined by IE *FreqBandIndicator* i.e. without suffix, value *maxFBI* indicates that the frequency band is indicated by means of an extension. In such a case, UEs not supporting the extension consider the field to be set to a not supported value.

### FreqBandIndicatorNR

The IE FreqBandIndicatorNR indicates the NR operating band as defined in TS 38.101 [85].

### FreqBandIndicatorNR information element

```
-- ASN1START
FreqBandIndicatorNR-r15 ::= INTEGER (1.. maxFBI-NR-r15)
-- ASN1STOP
```

### - MobilityControlInfo

-- ASN1START

The IE MobilityControlInfo includes parameters relevant for network controlled mobility to/within E-UTRA.

### MobilityControlInfo information element

ASNISIARI		
MobilityControlInfo ::= SEQUENCE {		
targetPhysCellId	PhysCellId,	
carrierFreq	CarrierFreqEUTRA	OPTIONAL, Cond HO-
toEUTRA2	Callferrequotica	official, cold no-
carrierBandwidth	CarrierBandwidthEUTRA	OPTIONAL, Cond HO-
toEUTRA	CalifierBandwidthEolKA	OPTIONAL, CONd HO-
	Additional Organization	ODUITONNI Cond UO
additionalSpectrumEmission	AdditionalSpectrumEmission	OPTIONAL, Cond HO-
toEUTRA		
t304	ENUMERATED {	20
	ms50, ms100, ms150, ms200, ms50 ms2000, ms10000-v1310},	JU, MSIUUU,
newUE-Identity	C-RNTI,	
radioResourceConfigCommon	RadioResourceConfigCommon,	
rach-ConfigDedicated	RACH-ConfigDedicated	OPTIONAL, Need OP
••••	, , , , , , , , , , , , , , , , , , ,	· · · , · · · · ·
[[ carrierFreq-v9e0	CarrierFreqEUTRA-v9e0	OPTIONAL Need ON
	Carrieric de Curre de Carrier	
[[ drb-ContinueROHC-r11	ENUMERATED {true}	OPTIONAL Cond HO
[[ mobilityControlInfoV2X-r14 Mob	ilityControlInfoV2V_r14	OPTIONAL, Need ON
handoverWithoutWT-Change-r14	ENUMERATED {keepLWA-Config, sendEnd	
Cond HO	ENOMERATED (REEPLWA-CONTIG, SENGENC	Marker; Opiional,
makeBeforeBreak-r14	ENUMERATED {true}	OPTIONAL, Need OR
rach-Skip-r14	RACH-Skip-r14	
sameSFN-Indication-r14	-	OPTIONAL, Need OR
	ENUMERATED {true}	OPTIONAL Cond HO-
SFNsynced		
]],		
[[		
mib-RepetitionStatus-r14	BOOLEAN	OPTIONAL, Need OR
schedulingInfoSIB1-BR-r14	INTEGER (031)	OPTIONAL Cond HO-
SFNsynced		
]]		
}		
	UENCE {	
additionalSpectrumEmission-v1010	AdditionalSpectrumEmission-v1010	OPTIONAL Need ON
}		
MobilityControlInfoSCG-r12 ::= SEQ	UENCE {	
t307-r12	ENUMERATED {	
	ms50, ms100, ms150, ms200, ms50	00, ms1000,
	ms2000, spare1},	
ue-IdentitySCG-r12		FIONAL, Cond SCGEst,
rach-ConfigDedicated-r12		FIONAL, Need OP
	heringAlgorithm-r12 OPTIONAL,	Need ON
	HELINGHIGOLICIAN ILZ OFIIONAL,	
• • • 1		

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	[[ makeBeforeBreakSCG-r14 rach-SkipSCG-r14	ENUMERATED {true} RACH-Skip-r14	OPTIONAL, Need OR OPTIONAL Need OR
}	]]		
Mob	ilityControlInfoV2X-r14 ::= SEQU	JENCE {	
	v2x-CommTxPoolExceptional-r14	SL-CommResourcePoolV2X-r14	OPTIONAL, Need OR
	v2x-CommRxPool-r14	SL-CommRxPoolListV2X-r14	OPTIONAL, Need OR
	v2x-CommSyncConfig-r14 cbr-MobilityTxConfigList-r14	SL-SyncConfigListV2X-r14 SL-CBR-CommonTxConfigList-r14	OPTIONAL, Need OR OPTIONAL Need OR
}	CDI-MODIIICyIXCOILIGHISC-II4	51-CBK-COMMONTACONFIGHTSt-114	OFIIONAL Need OK
Car	rierBandwidthEUTRA ::=	SEQUENCE {	
	dl-Bandwidth	ENUMERATED {	
		n6, n15, n25, n50, n75,	
		spare9, spare8, spare7, spare4, spare2,	
	ul-Bandwidth	ENUMERATED {	, sparer;,
		n6, n15, n25, n50, n75,	, n100, spare10,
		spare9, spare8, spare7,	
h		spare4, spare3, spare2,	, sparel} OPTIONAL Need OP
}			
Car	rierFreqEUTRA ::=	SEQUENCE {	
	dl-CarrierFreq	ARFCN-ValueEUTRA,	
h	ul-CarrierFreq	ARFCN-ValueEUTRA	OPTIONAL Cond FDD
}			
Car	rierFreqEUTRA-v9e0 ::=	SEQUENCE {	
	dl-CarrierFreq-v9e0	ARFCN-ValueEUTRA-r9,	
,	ul-CarrierFreq-v9e0	ARFCN-ValueEUTRA-r9 OPT	FIONAL Cond FDD
}			
RAC	H-Skip-r14 ::=	SEQUENCE {	
	targetTA-r14	CHOICE {	
	ta0-r14	NULL,	
	mcg-PTAG-r14 scg-PTAG-r14	NULL, NULL,	
	mcg-STAG-r14	STAG-Id-r11,	
	scg-STAG-r14	STAG-Id-r11	
	},		
	ul-ConfigInfo-r14	SEQUENCE {	
	numberOfConfUL-Processes-r14 ul-SchedInterval-r14	<pre>4 INTEGER (18), ENUMERATED {sf2, sf5, sf10},</pre>	
	ul-StartSubframe-r14	INTEGER (09),	
	ul-Grant-r14	BIT STRING (SIZE (16))	
	}	OPI	FIONAL Need OR
}			
	A GM1 GEOD		

-- ASN1STOP

### MobilityControlInfo field descriptions

### additionalSpectrumEmission

For a UE with no SCells configured for UL in the same band as the PCell, the UE shall apply the value for the PCell instead of the corresponding value from *SystemInformationBlockType2* or *SystemInformationBlockType1*. For a UE with SCell(s) configured for UL in the same band as the PCell, the UE shall, in case all SCells configured for UL in that band are released after handover completion, apply the value for the PCell instead of the corresponding value from *SystemInformationBlockType1*. The UE requirements related to IE *AdditionalSpectrumEmission* are defined in TS 36.101 [42], table 6.2.4-1, for UEs neither in CE nor BL UEs and TS

36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs.

### carrierBandwidth

Provides the parameters Downlink bandwidth, and Uplink bandwidth, see TS 36.101 [42].

### carrierFreq

Provides the EARFCN to be used by the UE in the target cell.

### cbr-MobilityTxConfigList

Indicates the list of CBR ranges and the list of PSSCH transmission parameter configurations available to configure congestion control to the UE for V2X sidelink communication during handover.

### cipheringAlgorithmSCG

Indicates the ciphering algorithm to be used for SCG DRBs. E-UTRAN includes the field upon SCG change when one or more SCG DRBs are configured. Otherwise E-UTRAN does not include the field.

### dl-Bandwidth

Parameter: Downlink bandwidth, see TS 36.101 [42].

### drb-ContinueROHC

This field indicates whether to continue or reset, for this handover, the header compression protocol context for the RLC UM bearers configured with the header compression protocol. Presence of the field indicates that the header compression protocol context continues while absence indicates that the header compression protocol context is reset. E-UTRAN includes the field only in case of a handover within the same eNB.

### handoverWithoutWT-Change

Indicates whether UE performs handover where LWA configuration is retained with the same WT If sendEndMarker is configured, the LWA end-marker for PDCP key change indication is used as defined in [8]. If value keepLWA-Config is configured, LWA end marker is not used and UE shall only retain the LWA configuration.

### makeBeforeBreak

Indicates that the UE shall continue uplink transmission/ downlink reception with the source cell(s) before performing the first transmission through PRACH to the target intra-frequency PCell, or performing initial PUSCH transmission to the target intra-frequency PCell while *rach-Skip* is configured.

### makeBeforeBreakSCG

Indicates that the UE shall continue uplink transmission/ downlink reception with the source cell(s) before performing the first transmission through PRACH to the target intra-frequency PSCell, or performing initial PUSCH transmission to the target intra-frequency PSCell while *rach-SkipSCG* is configured.

### mib-RepetitionStatus

Indicates whether additional MIB repetition is enabled in the target cell or not. Value TRUE indicates additional MIB repetition is enabled in the target cell. Value FALSE indicates additional MIB repetition is not enabled in the target cell. The absence of this field indicates additional MIB repetition may or may not be enabled in the target cell. See 5.2.1.2 and TS 36.211 [21], clause 6.4.1. This field is applicable to BL UE or UE in CE.

### mobilityControlInfoV2X

Indicates the sidelink configurations of the target cell for V2X sidelink communication during handover.

### numberOfConfUL-Processes

The number of configured HARQ processes for preallocated uplink grant, see TS 36.321 [6], clause 5.20. This field is applicable if a UE is configured with asynchronous HARQ, otherwise it shall be ignored.

### rach-ConfigDedicated

The dedicated random access parameters. If absent the UE applies contention based random access as specified in TS 36.321 [6].

### rach-Skip

This field indicates whether random access procedure for the target PCell is skipped.

### rach-SkipSCG

This field indicates whether random access procedure for the target PSCell is skipped.

### sameSFN-Indication

This field indicates that the target cell has the same SFN as the source cell and that the BL UE or UE in CE is not required to acquire *MasterInformationBlock* in the target PCell during handover to obtain the SFN of the target cell, as specified in clause 5.3.5.4.

### schedulingInfoSIB1-BR

Indicates the index to the tables that define *SystemInformationBlockType1-BR* scheduling information. The tables are specified in TS 36.213 [23], Table 7.1.6-1 and Table 7.1.7.2.7-1. Value 0 means *SystemInformationBlockType1-BR* is not scheduled. If absent when *sameSFN-Indication* is present, UE assumes that *SystemInformationBlockType1-BR* scheduling information in target cell may be different from source cell.

### t304

Timer T304 as described in clause 7.3. ms50 corresponds with 50 ms, ms100 corresponds with 100 ms and so on. EUTRAN includes extended value *ms10000-v1310* only when UE supports CE.

### MobilityControlInfo field descriptions

additionalSpectrumEmission For a UE with no SCells configured for UL in the same band as the PCell, the UE shall apply the value for the PCell instead of the corresponding value from SystemInformationBlockType2 or SystemInformationBlockType1. For a UE with SCell(s) configured for UL in the same band as the PCell, the UE shall, in case all SCells configured for UL in that band are released after handover completion, apply the value for the PCell instead of the corresponding value from SystemInformationBlockType2 or SystemInformationBlockType1. The UE requirements related to IE AdditionalSpectrumEmission are defined in TS 36.101 [42], table 6.2.4-1, for UEs neither in CE nor BL UEs and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs.

t307

Timer T307 as described in clause 7.3. ms50 corresponds with 50 ms, ms100 corresponds with 100 ms and so on. targetTA

This field refers to the timing adjustment indication, see TS 36.213 [23], indicating the NTA value which the UE shall use for the target PTAG of handover or the target PSTAG of SCG change. ta0 corresponds to NTA=0. mcg-PTAG corresponds to the latest NTA value of the PTAG associated with MCG. scg-PTAG corresponds to the latest NTA value of the PTAG associated with SCG. mcg-STAG corresponds to the latest NTA value of a MCG STAG indicated by the STAG-Id. scg-STAG corresponds to the latest NTA value of a SCG STAG indicated by the STAG-Id.

### ul-Bandwidth

Parameter: Uplink bandwidth, see TS 36.101 [42], table 5.6-1. For TDD, the parameter is absent and it is equal to downlink bandwidth. If absent for FDD, apply the same value as applies for the downlink bandwidth.

### ul-Grant

Indicates the resources of the target PCell/PSCell to be used for the uplink transmission of PUSCH [23], clause 8.8. ul-SchedInterval

Indicates the scheduling interval in uplink, see TS 36.321 [6], clause 5.20. Value in number of sub-frames. Value sf2 corresponds to 2 subframes, sf5 corresponds to 5 subframes and so on.

### ul-StartSubframe

Indicates the subframe in which the UE may initiate the uplink transmission, see TS 36.321 [6], clause 5.20. Value 0 corresponds to subframe number 0, 1 correponds to subframe number 1 and so on. The subframe indicating a valid uplink grant according to the calculation of UL grant configured by ul-StartSubframe and ul-SchedInterval, see TS 36.321 [6], clause 5.20, is the same across all radio frames.

### v2x-CommRxPool

Indicates reception pools for receiving V2X sidelink communication during handover.

### v2x-CommSyncConfig

Indicates synchronization configurations for performing V2X sidelink communication during handover.

### v2x-CommTxPoolExceptional

Indicates the transmission resources by which the UE is allowed to transmit V2X sidelink communication during handover.

Conditional presence	Explanation
FDD	The field is mandatory with default value (the default duplex distance defined for the concerned band, as specified in TS 36.101 [42]) in case of "FDD"; otherwise the field is not present.
НО	This field is optionally present, need OP, in case of handover within E-UTRA when the <i>fullConfig</i> is not included; otherwise the field is not present.
HO-SFNsynced	This field is optionally present, need OP, in case of source E-UTRA and target E-UTRA cells are SFN synchronised.
HO-toEUTRA	The field is mandatory present in case of inter-RAT handover to E-UTRA; otherwise the field is optionally present, need ON.
HO-toEUTRA2	The field is absent if <i>carrierFreq-v9e0</i> is present. Otherwise it is mandatory present in case of inter-RAT handover to E-UTRA and optionally present, need ON, in all other cases.
SCGEst	This field is mandatory present in case of SCG establishment; otherwise the field is optionally present, need ON.

### MobilityParametersCDMA2000 (1xRTT)

The MobilityParametersCDMA2000 contains the parameters provided to the UE for handover and (enhanced) CSFB to 1xRTT support, as defined in C.S0097 [53].

### MobilitvParametersCDMA2000 information element

ASN1START		
MobilityParametersCDMA2000 ::=	OCTET STRING	

-- ASN1STOP

### MobilityStateParameters

The IE MobilityStateParameters contains parameters to determine UE mobility state.

### MobilityStateParameters information element

ASNISIARI	
MobilityStateParameters ::=	SEQUENCE {
t-Evaluation	ENUMERATED {
	s30, s60, s120, s180, s240, spare3, spare2, spare1},
t-HystNormal	ENUMERATED {
	s30, s60, s120, s180, s240, spare3, spare2, spare1},
n-CellChangeMedium	INTEGER (116),
n-CellChangeHigh	INTEGER (116)
}	

```
-- ASN1STOP
```

### MobilityStateParameters field descriptions

n-CellChangeHigh
The number of cell changes to enter high mobility state. Corresponds to N _{CR_H} in TS 36.304 [4].
n-CellChangeMedium
The number of cell changes to enter medium mobility state. Corresponds to NCR_M in TS 36.304 [4].
t-Evaluation
The duration for evaluating criteria to enter mobility states. Corresponds to T _{CRmax} in TS 36.304 [4]. Value in seconds,
s30 corresponds to 30 s and so on.
t-HystNormal
The additional duration for evaluating criteria to enter normal mobility state. Corresponds to T _{CRmaxHyst} in TS 36.304 [4].
Value in seconds, s30 corresponds to 30 s and so on.

### **MultiBandInfoList**

### MultiBandInfoList information element

```
-- ASN1START
```

-- ASN1START

```
MultiBandInfoList ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator
MultiBandInfoList-v9e0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF MultiBandInfo-v9e0
MultiBandInfoList-v10j0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF NS-PmaxList-r10
MultiBandInfoList-v10l0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF NS-PmaxList-v10l0
MultiBandInfoList-r11 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-r11
MultiBandInfo-v9e0 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-r11
MultiBandInfo-v9e0 ::= SEQUENCE {
    freqBandIndicator-v9e0 OPTIONAL -- Need OP
}
-- ASN1STOP
```

### MultiFrequencyBandListNR

The IE MultiFrequencyBandListNR is used to configure a list of one or multiple NR frequency bands.

### MultiFrequencyBandListNR information element

MultiFrequencyBandListNR-r15 ::= SEQUENCE (SIZE (1.. maxMultiBandsNR-r15)) OF FreqBandIndicatorNR-r15

-- ASN1STOP

### NS-PmaxList

The IE NS-PmaxList concerns a list of additionalPmax and additionalSpectrumEmission, as defined in TS 36.101 [42], table 6.2.4-1, for UEs neither in CE nor BL UEs and TS 36.101 [42], table 6.2.4E-1, for UEs in CE or BL UEs, for a given frequency band. E-UTRAN does not include the same value of additionalSpectrumEmission in SystemInformationBlockType2 within this list.

### NS-PmaxList information element

```
-- ASN1START
NS-PmaxList-r10 ::=
                               SEQUENCE (SIZE (1..maxNS-Pmax-r10)) OF NS-PmaxValue-r10
NS-PmaxList-v1010 ::=
                               SEQUENCE (SIZE (1..maxNS-Pmax-r10)) OF NS-PmaxValue-v1010
NS-PmaxValue-r10 ::=
                               SEQUENCE {
   additionalPmax-r10
                                       P-Max
                                                                       OPTIONAL,
                                                                                 -- Need OP
    additionalSpectrumEmission
                                       AdditionalSpectrumEmission
}
NS-PmaxValue-v1010 ::=
                              SEQUENCE {
   additionalSpectrumEmission-v1010
                                     AdditionalSpectrumEmission-v1010 OPTIONAL
                                                                                       -- Need OP
}
-- ASN1STOP
```

– NS-PmaxListNR

The IE *NS-PmaxListNR* concerns a list of *additionalPmax* and *additionalSpectrumEmission*, as defined in TS 38.101 [85], table 6.2.3-1 for a given frequency band.

### NS-PmaxListNR information element

```
-- ASN1START

NS-PmaxListNR-r15 ::= SEQUENCE (SIZE (1..8)) OF NS-PmaxValueNR-r15

NS-PmaxValueNR-r15 ::= SEQUENCE {

additionalPmaxNR-r15 P-MaxNR-r15 OPTIONAL, -- Need ON

additionalSpectrumEmissionNR-r15 AdditionalSpectrumEmissionNR-r15

}

-- ASN1STOP
```

### – PhysCellId

The IE *PhysCellId* is used to indicate the physical layer identity of the cell, as defined in TS 36.211 [21].

### PhysCellId information element

```
-- ASN1START
PhysCellId ::=
```

INTEGER (0..503)

```
-- ASN1STOP
```

### PhysCellIdRange

The IE *PhysCellIdRange* is used to encode either a single or a range of physical cell identities. The range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range. For fields comprising multiple occurrences of *PhysCellIdRange*, E-UTRAN may configure overlapping ranges of physical cell identities.

### PhysCellIdRange information element

```
-- ASN1START
PhysCellIdRange ::= SEQUENCE {
   start PhysCellId,
   range ENUMERATED {
        n4, n8, n12, n16, n24, n32, n48, n64, n84,
        n96, n128, n168, n252, n504, spare2,
        spare1} OPTIONAL -- Need OP
}
-- ASN1STOP
```

### PhysCellIdRange field descriptions

*range* Indicates the number of physical cell identities in the range (including *start*). Value n4 corresponds with 4, n8 corresponds with 8 and so on. The UE shall apply value 1 in case the field is absent, in which case only the physical cell identity value indicated by *start* applies.

Indicates the lowest physical cell identity in the range.

### PhysCellIdRangeUTRA-FDDList

The IE *PhysCellIdRangeUTRA-FDDList* is used to encode one or more of *PhysCellIdRangeUTRA-FDD*. While the IE *PhysCellIdRangeUTRA-FDD* is used to encode either a single physical layer identity or a range of physical layer identities, i.e. primary scrambling codes. Each range is encoded by using a *start* value and by indicating the number of consecutive physical cell identities (including *start*) in the range.

### PhysCellIdRangeUTRA-FDDList information element

```
-- ASN1START
PhysCellIdRangeUTRA-FDDList-r9::= SEQUENCE (SIZE (1..maxPhysCellIdRange-r9)) OF
PhysCellIdRangeUTRA-FDD-r9
PhysCellIdRangeUTRA-FDD-r9 ::= SEQUENCE {
    start-r9 PhysCellIdUTRA-FDD,
    range-r9 INTEGER (2..512) OPTIONAL -- Need OP
}
```

-- ASN1STOP

### PhysCellIdRangeUTRA-FDDList field descriptions

*range* Indicates the number of primary scrambling codes in the range (including *start*). The UE shall apply value 1 in case the field is absent, in which case only the primary scrambling code value indicated by *start* applies. *start* 

Indicates the lowest primary scrambling code in the range.

### PhysCellIdCDMA2000

The IE PhysCellIdCDMA2000 identifies the PNOffset that represents the "Physical cell identity" in CDMA2000.

### PhysCellIdCDMA2000 information element

-- ASN1START

PhysCellIdCDMA2000 ::= INTEGER (0..maxPNOffset)

-- ASN1STOP

### PhysCellIdGERAN

The IE PhysCellIdGERAN contains the Base Station Identity Code (BSIC).

### PhysCellIdGERAN information element

ASN1START	
PhysCellIdGERAN ::= networkColourCode baseStationColourCode }	SEQUENCE { BIT STRING (SIZE (3)), BIT STRING (SIZE (3))

-- ASN1STOP

PhysCellIdGERAN field descriptions		
baseStationColourCode		
Base station Colour Code as defined in TS 23.003 [27].		
networkColourCode		
Network Colour Code as defined in TS 23.003 [27].		

PhysCellIdNR

The IE PhysCellIdNR indicates the physical layer identity (PCI) of an NR cell.

### PhysCellIdNR information element

```
-- ASN1START
PhysCellIdNR-r15 ::= INTEGER (0.. 1007)
-- ASN1STOP
```

### PhysCellIdUTRA-FDD

The IE *PhysCellIdUTRA-FDD* is used to indicate the physical layer identity of the cell, i.e. the primary scrambling code, as defined in TS 25.331 [19].

### PhysCellIdUTRA-FDD information element

```
-- ASN1START
PhysCellIduTRA-FDD ::= INTEGER (0..511)
-- ASN1STOP
```

### PhysCellIdUTRA-TDD

The IE *PhysCellIdUTRA-TDD* is used to indicate the physical layer identity of the cell, i.e. the cell parameters ID (TDD), as specified in TS 25.331 [19]. Also corresponds to the Initial Cell Parameter Assignment in TS 25.223 [46].

### PhysCellIdUTRA-TDD information element

ASN1START	
PhysCellIdUTRA-TDD ::=	INTEGER (0127)

-- ASN1STOP

### PLMN-Identity

The IE *PLMN-Identity* identifies a Public Land Mobile Network. Further information regarding how to set the IE are specified in TS 23.003 [27].

### PLMN-Identity information element

ASNISIARI			
<pre>PLMN-Identity ::=     mcc     mnc }</pre>	SEQUENCE { MCC MNC	OPTIONAL,	Cond MCC
MCC ::=	SEQUENCE (SIZE (3)) OF MCC-MNC-Digit		
MNC ::=	SEQUENCE (SIZE (23)) ( MCC-MNC-Digit	OF	
MCC-MNC-Digit ::=	INTEGER (09)		

-- ASN1STOP

### PLMN-Identity field descriptions

*mcc* The first element contains the first MCC digit, the second element the second MCC digit and so on. If the field is absent, it takes the same value as the mcc of the immediately preceding IE PLMN-Identity. See TS 23.003 [27]. *mnc* 

The first element contains the first MNC digit, the second element the second MNC digit and so on. See TS 23.003 [27].

Conditional presence	Explanation
MCC	This IE is mandatory when PLMN-Identity is included in CellGlobalIdEUTRA, in
	CellGloballdUTRA, in CellGloballdGERAN or in RegisteredMME. This IE is also
	mandatory in the first occurrence of the IE PLMN-Identity within the IE PLMN-IdentityList.
	Otherwise it is optional, need OP.

### PLMN-IdentityList3

Includes a list of PLMN identities.

### PLMN-IdentityList3 information element

ASN1START					
PLMN-IdentityList3-r11 ::=	SEQUENCE	(SIZE	(116))	OF	PLMN-Identity
ASN1STOP					

### - PmaxNR

The IE *PmaxNR* concerns a list of *additionalPmax* and *additionalSpectrumEmission*, as defined in TS 38.101 [85], table 6.2.3-1 for a given frequency band.

### **PmaxNR** information element

ASN1START	
P-MaxNR-r15 ::=	INTEGER (-3033)

-- ASN1STOP

– PreRegistrationInfoHF	RPD
ASN1START	
<pre>PreRegistrationInfoHRPD ::= SEQ preRegistrationAllowed preRegistrationZoneId secondaryPreRegistrationZoneIdList }</pre>	JENCE { BOOLEAN, PreRegistrationZoneIdHRPD OPTIONAL, cond PreRegAllowed SecondaryPreRegistrationZoneIdListHRPD OPTIONAL Need OR
SecondaryPreRegistrationZoneIdListHRPD	::= SEQUENCE (SIZE (12)) OF PreRegistrationZoneIdHRPD
PreRegistrationZoneIdHRPD ::=	INTEGER (0255)
ASN1STOP	

# PreRegistrationInfoHRPD field descriptions preRegistrationAllowed

TRUE indicates that a UE shall perform a CDMA2000 HRPD pre-registration if the UE does not have a valid / current pre-registration. FALSE indicates that the UE is not allowed to perform CDMA2000 HRPD pre-registration in the current cell.

### preRegistrationZoneID

ColorCode (see C.S0024 [26], C.S0087 [44]) of the CDMA2000 Reference Cell corresponding to the HRPD sector under the HRPD AN that is configured for this LTE cell. It is used to control when the UE should register or re-register. secondaryPreRegistrationZoneldList

# List of SecondaryColorCodes (see C.S0024 [26], C.S0087 [44]) of the CDMA2000 Reference Cell corresponding to the HRPD sector under the HRPD AN that is configured for this LTE cell. They are used to control when the UE should reregister.

Conditional presence	Explanation	
PreRegAllowed	The field is mandatory in case the preRegistrationAllowed is set to true. Otherwise the	
	field is not present and the UE shall delete any existing value for this field.	

### Q-QualMin

The IE *Q*-*QualMin* is used to indicate for cell selection/re-selection the required minimum received RSRQ level in the (E-UTRA) cell. Corresponds to parameter  $Q_{qualmin}$  in TS 36.304 [4]. Actual value  $Q_{qualmin}$  = field value [dB].

### **Q-QualMin** information element

	ASN1START			
Q-Q	)ualMin-r9	:	: =	=

INTEGER (-34..-3)

-- ASN1STOP

### Q-RxLevMin

The IE *Q*-*RxLevMin* is used to indicate for cell selection/ re-selection the required minimum received RSRP level in the (E-UTRA) cell. Corresponds to parameter  $Q_{rxlevmin}$  in TS 36.304 [4]. Actual value  $Q_{rxlevmin}$  = field value * 2 [dBm].

### Q-RxLevMin information element

-- ASN1START Q-RxLevMin ::=

INTEGER (-70..-22)

-- ASN1STOP

### Q-OffsetRange

The IE Q-OffsetRange is used to indicate a cell, CSI-RS resource or frequency specific offset to be applied when evaluating candidates for cell re-selection or when evaluating triggering conditions for measurement reporting. The value in dB. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -22 dB and so on.

### Q-OffsetRange information element

```
-- ASN1START
0-OffsetRange ::=
                                                               ENUMERATED {
                                                                           dB-24, dB-22, dB-20, dB-18, dB-16, dB-14, dB-12, dB-10, dB-8, dB-6, dB-5, dB-4, dB-3,
                                                                           dB-2, dB-1, dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10, dB12, dB14, dB16, dB18,
                                                                            dB20, dB22, dB24}
```

-- ASN1STOP

### Q-OffsetRangeInterRAT

The IE Q-OffsetRangeInterRAT is used to indicate a frequency specific offset to be applied when evaluating triggering conditions for measurement reporting. The value in dB.

### Q-OffsetRangeInterRAT information element

```
-- ASN1START
Q-OffsetRangeInterRAT ::=
                                             INTEGER (-15..15)
-- ASN1STOP
```

```
ReselectionThreshold
```

The IE *ReselectionThreshold* is used to indicate an Rx level threshold for cell reselection. Actual value of threshold = field value * 2 [dB].

### ReselectionThreshold information element

```
-- ASN1START
ReselectionThreshold ::=
                                         INTEGER (0..31)
-- ASN1STOP
```

### ReselectionThresholdQ

The IE ReselectionThresholdQ is used to indicate a quality level threshold for cell reselection. Actual value of threshold = field value [dB].

### ReselectionThresholdQ information element

```
ReselectionThresholdQ-r9 ::=
                                        INTEGER (0..31)
```

-- ASN1STOP

-- ASN1START

### SCellIndex

The IE SCellIndex concerns a short identity, used to identify an SCell.

### SCellIndex information element

-- ASN1START

SCellIndex-r10 ::= SCellIndex-r13 ::=

INTEGER (1..7) INTEGER (1..31)

-- ASN1STOP

### – ServCellIndex

The IE *ServCellIndex* concerns a short identity, used to identify a serving cell (i.e. the PCell or an SCell). Value 0 applies for the PCell, while the *SCellIndex* that has previously been assigned applies for SCells.

INTEGER (0..7)

INTEGER (0..31)

### ServCellIndex information element

```
-- ASN1START
```

```
ServCellIndex-r10 ::=
ServCellIndex-r13 ::=
```

-- ASN1STOP

### SpeedStateScaleFactors

The IE *SpeedStateScaleFactors* concerns factors, to be applied when the UE is in medium or high speed state, used for scaling a mobility control related parameter.

### SpeedStateScaleFactors information element

```
SpeedStateScaleFactors ::= SEQUENCE {
sf-Medium ENUMERATED {oDot25, oDot5, oDot75, 1Dot0},
sf-High ENUMERATED {oDot25, oDot5, oDot75, 1Dot0}
}
```

-- ASN1STOP

-- ASN1START

### SpeedStateScaleFactors field descriptions

sf-High

The concerned mobility control related parameter is multiplied with this factor if the UE is in High Mobility state as defined in TS 36.304 [4]. Value oDot25 corresponds to 0.25, oDot5 corresponds to 0.5, oDot75 corresponds to 0.75 and so on.

### sf-Medium

The concerned mobility control related parameter is multiplied with this factor if the UE is in Medium Mobility state as defined in TS 36.304 [4]. Value oDot25 corresponds to 0.25, oDot5 corresponds to 0.5, oDot75 corresponds to 0.75 and so on.

SystemInfoListGERAN

The IE SystemInfoListGERAN contains system information of a GERAN cell.

### SystemInfoListGERAN information element

-- ASN1START

SystemInfoListGERAN ::=

SEQUENCE (SIZE (1..maxGERAN-SI)) OF OCTET STRING (SIZE (1..23))

-- ASN1STOP

### SystemInfoListGERAN field descriptions

### SystemInfoListGERAN

Each OCTET STRING contains one System Information (SI) message as defined in TS 44.018 [45], table 9.1.1, excluding the L2 Pseudo Length, the RR management Protocol Discriminator and the Skip Indicator or a complete Packet System Information (PSI) message as defined in TS 44.060 [36], table 11.2.1.

### SystemTimeInfoCDMA2000

The IE *SystemTimeInfoCDMA2000* informs the UE about the absolute time in the current cell. The UE uses this absolute time knowledge to derive the CDMA2000 Physical cell identity, expressed as PNOffset, of neighbour CDMA2000 cells.

NOTE: The UE needs the CDMA2000 system time with a certain level of accuracy for performing measurements as well as for communicating with the CDMA2000 network (HRPD or 1xRTT).

### SystemTimeInfoCDMA2000 information element

SystemTimeInfoCDMA2000 ::=	SEQUENCE {
cdma-EUTRA-Synchronisation	BOOLEAN,
cdma-SystemTime	CHOICE {
synchronousSystemTime	BIT STRING (SIZE (39)),
asynchronousSystemTime	BIT STRING (SIZE (49))
}	
}	

### -- ASN1STOP

-- ASN1START

### SystemTimeInfoCDMA2000 field descriptions

### asynchronousSystemTime

The CDMA2000 system time corresponding to the SFN boundary at or after the ending boundary of the SI-Window in which *SystemInformationBlockType8* is transmitted. E-UTRAN includes this field if the E-UTRA frame boundary is not aligned to the start of CDMA2000 system time. This field size is 49 bits and the unit is 8 CDMA chips based on 1.2288 Mcps.

### cdma-EUTRA-Synchronisation

TRUE indicates that there is no drift in the timing between E-UTRA and CDMA2000. FALSE indicates that the timing between E-UTRA and CDMA2000 can drift. NOTE 1

### synchronousSystemTime

CDMA2000 system time corresponding to the SFN boundary at or after the ending boundary of the SI-window in which *SystemInformationBlockType8* is transmitted. E-UTRAN includes this field if the E-UTRA frame boundary is aligned to the start of CDMA2000 system time. This field size is 39 bits and the unit is 10 ms based on a 1.2288 Mcps chip rate.

NOTE 1: The following table shows the recommended combinations of the *cdma-EUTRA-Synchronisation* field and the choice of cdma-SystemTime included by E-UTRAN for FDD and TDD:

FDD/TDD	cdma-EUTRA-Synchronisation	synchronousSystemTime	asynchronousSystemTime
FDD	FALSE	Not Recommended	Recommended
FDD	TRUE	Recommended	Recommended
TDD	FALSE	Not Recommended	Recommended
TDD	TRUE	Recommended	Recommended

### ThresholdNR

The IE ThresholdNR and IE ThresholdListNR contain thresholds for NR related inter-RAT measurements.

### ThresholdNR information element

-- ASN1START

ThresholdNR-r15 ::= nr-RSRP-r15 nr-RSRQ-r15 nr-SINR-r15 }	CHOICE{ RSRP-RangeNR-r15, RSRQ-RangeNR-r15, RS-SINR-RangeNR-r15	
<pre>ThresholdListNR-r15 ::=     nr-RSRP-r15     nr-RSRQ-r15     nr-SINR-r15 }</pre>	SEQUENCE{ RSRP-RangeNR-r15 RSRQ-RangeNR-r15 RS-SINR-RangeNR-r15	OPTIONAL, Need OR OPTIONAL, Need OR OPTIONAL Need OR
ASN1STOP		

### – TrackingAreaCode

The IE TrackingAreaCode is used to identify a tracking area within the scope of a PLMN, see TS 24.301 [35].

### TrackingAreaCode information element

ASN1START				
TrackingAreaCode ::= TrackingAreaCode-5GC-r15	::=	STRING STRING	<b>v</b>	, ,

-- ASN1STOP

T-Reselection

The IE *T*-Reselection concerns the cell reselection timer Treselection_{RAT} for E-UTRA, UTRA, GERAN or CDMA2000. Value in seconds. For value 0, behaviour as specified in 7.3.2 applies.

### T-Reselection information element

```
-- ASN1START

T-Reselection ::= INTEGER (0..7)

-- ASN1STOP
```

### - T-ReselectionEUTRA-CE

The IE *T*-*ReselectionEUTRA-CE* concerns the cell reselection timer Treselection_{EUTRA_CE} as specified in TS 36.304 [4]. Value in seconds. For value 0, behaviour as specified in 7.3.2 applies.

### T-ReselectionEUTRA-CE information element

```
-- ASN1START
T-ReselectionEUTRA-CE-r13 ::= INTEGER (0..15)
-- ASN1STOP
```

### 6.3.5 Measurement information elements

### AllowedMeasBandwidth

The IE *AllowedMeasBandwidth* is used to indicate the maximum allowed measurement bandwidth on a carrier frequency as defined by the parameter Transmission Bandwidth Configuration " $N_{RB}$ " TS 36.104 [47]. The values mbw6, mbw15, mbw25, mbw50, mbw75, mbw100 indicate 6, 15, 25, 50, 75 and 100 resource blocks respectively.

### AllowedMeasBandwidth information element

```
-- ASN1START
AllowedMeasBandwidth ::=
                                         ENUMERATED {mbw6, mbw15, mbw25, mbw50, mbw75, mbw100}
-- ASN1STOP
```

**BT-NameList** 

The IE BT-NameList is used to indicate the names of the Bluetooth beacon which the UE is configured to measure.

### **BT-NameList** information element

```
-- ASN1START
BT-NameListConfig-r15 ::=
                                 CHOICE {
   release
                                NULL,
                                BT-NameList-r15
    setup
}
BT-NameList-r15 ::=
                            SEQUENCE (SIZE (1..maxBT-Name-r15)) OF BT-Name-r15
BT-Name-r15 ::=
                    OCTET STRING (SIZE (1..248))
-- ASN1STOP
```

### **BT-NameList field descriptions**

If configured, the UE only performs Bluetooth measurements according to the names identified. For each name, it refers to LOCAL NAME defined in Bluetooth specification [93].

### CSI-RSRP-Range

The IE CSI-RSRP-Range specifies the value range used in CSI-RSRP measurements and thresholds. Integer value for CSI-RSRP measurements according to mapping table in TS 36.133 [16].

### CSI-RSRP-Range information element

```
-- ASN1START
CSI-RSRP-Range-r12 ::=
                                             INTEGER(0..97)
-- ASN1STOP
```

Hysteresis

The IE Hysteresis is a parameter used within the entry and leave condition of an event triggered reporting condition. The actual value is field value * 0.5 dB, except if included in reportConfigEUTRA and associated to eventV1 or eventV2. If included in reportConfigEUTRA and associated to eventV1 or eventV2, the actual value is field value divided by 100.

### Hysteresis information element

```
-- ASN1START
Hysteresis ::=
```

bt-Name

INTEGER (0..30)

-- ASN1STOP

### LocationInfo

The IE *LocationInfo* is used to transfer detailed location information available at the UE to correlate measurements and UE position information.

### LocationInfo information element

```
-- ASN1START
LocationInfo-r10 ::= SEQUENCE {
                                            CHOICE {
    locationCoordinates-r10
                                            OCTET STRING,
        ellipsoid-Point-r10
        ellipsoidPointWithAltitude-r10
                                                OCTET STRING,
    . . .
        ellipsoidPointWithUncertaintyCircle-r11
                                                                 OCTET STRING,
        ellipsoidPointWithUncertaintyEllipse-r11
                                                                 OCTET STRING,
        ellipsoidPointWithAltitudeAndUncertaintyEllipsoid-r11 OCTET STRING,
        ellipsoidArc-r11
                                                                OCTET STRING,
       polygon-r11
                                                                 OCTET STRING
    },
    horizontalVelocity-r10
                                            OCTET STRING
                                                                         OPTIONAL,
    gnss-TOD-msec-r10
                                            OCTET STRING
                                                                         OPTIONAL,
    ...,
[[ verticalVelocityInfo-r15 CHOICE {
verticalVelocity-r15 C
                                                 OCTET STRING,
            verticalVelocityAndUncertainty-r15 OCTET STRING
                OPTIONAL
    }
    11
}
```

-- ASN1STOP

	Info field descriptions
ellipsoidArc	
Parameter EllipsoidArc defined in TS 36.355 [54]. The	e first/leftmost bit of the first octet contains the most significant
bit.	
ellipsoid-Point	
Parameter Ellipsoid-Point defined in TS 36.355 [54].	The first/leftmost bit of the first octet contains the most significan
bit.	
ellipsoidPointWithAltitude	
Parameter EllipsoidPointWithAltitude defined in TS 3	6.355 [54]. The first/leftmost bit of the first octet contains the mos
significant bit.	
ellipsoidPointWithAltitudeAndUncertaintyEllipsoi	id
	Ellipsoid defined in TS 36.355 [54]. The first/leftmost bit of the first
octet contains the most significant bit.	
ellipsoidPointWithUncertaintyCircle	
	ed in TS 36.355 [54]. The first/leftmost bit of the first octet
contains the most significant bit.	
ellipsoidPointWithUncertaintyEllipse	
	ed in TS 36.355 [54]. The first/leftmost bit of the first octet
contains the most significant bit.	
gnss-TOD-msec	
Parameter <i>Gnss-TOD-msec</i> defined in TS 36.355 [54	1]. The first/leftmost bit of the first octet contains the most
significant bit.	
horizontalVelocity	
Parameter HorizontalVelocity defined in TS 36.355 [5	54]. The first/leftmost bit of the first octet contains the most
significant bit.	
polygon	
	st/leftmost bit of the first octet contains the most significant bit.
verticalVelocityAndUncertainty	
	ds to <i>horizontalWithVerticalVelocityAndUncertainty</i> defined in TS
36.355 [54]. The first/leftmost bit of the first octet cont	
verticalVelocity	
•	WithVerticalVelocity defined in TS 36.355 [54]. The first/leftmost
bit of the first octet contains the most significant bit.	

### LogMeasResultListBT

The IE LogMeasResultListBT covers measured results for Bluetooth.

### LogMeasResultListBT information element

```
-- ASN1START

LogMeasResultListBT-r15 ::= SEQUENCE (SIZE (1..maxBT-IdReport-r15)) OF LogMeasResultBT-r15

LogMeasResultBT-r15 ::= SEQUENCE {

bt-Addr-r15 BIT STRING (SIZE (48)),

rssi-BT-r15 INTEGER (-128..127) OPTIONAL,

...

}
```

-- ASN1STOP

### LogMeasResultListBT field descriptions

*bt-Addr* This field indicates the Bluetooth public address of the Bluetooth beacon as defined in TS 36.355 [54]. *rssi-BT* This field provides the beacon received signal strength indicator (RSSI) in dBm as defined in TS 36.355 [54].

### LogMeasResultListWLAN

The IE LogMeasResultListWLAN covers measured results for WLAN.

### LogMeasResultListWLAN information element

```
-- ASN1START

LogMeasResultListWLAN-r15 ::= SEQUENCE (SIZE (1..maxWLAN-Id-Report-r14)) OF LogMeasResultWLAN-

r15

LogMeasResultWLAN-r15 ::= SEQUENCE {

   wlan-Identifiers-r15 WLAN-Identifiers-r12,

   rssiWLAN-r15 WLAN-RSSI-Range-r13 OPTIONAL,

   rtt-WLAN-r15 WLAN-RTT-r15 OPTIONAL,

   ...

}
```

-- ASN1STOP

### LogMeasResultListWLAN field descriptions

 rssiWLAN

 Measured WLAN RSSI result in dBm.

 rtt-WLAN

 This field provides the measured round trip time between the target device and WLAN AP and optionally the accuracy expressed as the standard deviation of the delay. Units for each of these are 1000ns, 100ns, 10ns, 1ns, and 0.1ns as defined in TS 36.355 [54].

 wlan-Identifiers

 Indicates the WLAN parameters used for identification of the WLAN for which the measurement results are applicable.

### – MaxRS-IndexCellQualNR

The IE *MaxRS-IndexCellQualNR* indicates the maximum number of RS indices to be considered/ averaged to derive the cell quality for RRM.

### MaxRS-IndexCellQualNR information element

```
-- ASN1START
MaxRS-IndexCellQualNR-r15::= INTEGER (1..maxRS-IndexCellQual-r15)
```

-- ASN1STOP

### MBSFN-RSRQ-Range

The IE *MBSFN-RSRQ-Range* specifies the value range used in MBSFN RSRQ measurements. Integer value for MBSFN RSRQ measurements according to mapping table in TS 36.133 [16].

### MBSFN-RSRQ-Range information element

```
-- ASN1START
```

-- ASN1START

```
MBSFN-RSRQ-Range-r12 ::=
-- ASN1STOP
```

INTEGER(0..31)

_

### MeasConfig

The IE *MeasConfig* specifies measurements to be performed by the UE, and covers intra-frequency, inter-frequency and inter-RAT mobility as well as configuration of measurement gaps.

### MeasConfig information element

ASNISIARI			
MeasConfig ::=	SEQUENCE {		
Measurement objects			
measObjectToRemoveList	MeasObjectToRemoveList	OPTIONAL,	Need ON
measObjectToAddModList	MeasObjectToAddModList	OPTIONAL,	Need ON
Reporting configurations	<u> </u>		
reportConfigToRemoveList	ReportConfigToRemoveList	OPTIONAL,	Need ON
reportConfigToAddModList	ReportConfigToAddModList	OPTIONAL,	Need ON
Measurement identities			
measIdToRemoveList	MeasIdToRemoveList	OPTIONAL,	Need ON
measIdToAddModList	MeasIdToAddModList	OPTIONAL,	Need ON
Other parameters			
quantityConfig	QuantityConfig	OPTIONAL,	Need ON
measGapConfig	MeasGapConfig	OPTIONAL,	Need ON
s-Measure	RSRP-Range	OPTIONAL,	Need ON
preRegistrationInfoHRPD	PreRegistrationInfoHRPD	OPTIONAL,	Need OP
speedStatePars CHOICE	-	,	
release	NULL,		
setup	SEQUENCE {		
mobilityStateParameters	MobilityStateParameters,		
timeToTrigger-SF	SpeedStateScaleFactors		
}			
}		OPTIONAL,	Need ON
, ,			
[[ measObjectToAddModList-v9e0	MeasObjectToAddModList-v9e0	OPTIONAL	Need ON
]],			
[[ allowInterruptions-r11	BOOLEAN	OPTIONAL	Need ON
]],			
[[ measScaleFactor-r12	CHOICE {		
release	NULL,		
setup	MeasScaleFactor-r12		
}	(	OPTIONAL,	Need ON
measIdToRemoveListExt-r12	MeasIdToRemoveListExt-r12	OPTIONAL,	Need ON
measIdToAddModListExt-r12	MeasIdToAddModListExt-r12	OPTIONAL,	Need ON
measRSRQ-OnAllSymbols-r12	BOOLEAN	OPTIONAL	Need ON
]],			
[[			
measObjectToRemoveListExt-r1		3 OPTIONAL,	Need ON
measObjectToAddModListExt-r1	13 MeasObjectToAddModListExt-r13	3 OPTIONAL,	Need ON
measIdToAddModList-v1310	MeasIdToAddModList-v1310	OPTIONAL,	Need ON
measIdToAddModListExt-v1310	MeasIdToAddModListExt-v1310	OPTIONAL	Need ON
]],			
[[ measGapConfigPerCC-List-r14	MeasGapConfigPerCC-List-r14	OPTIONAL,	Need ON
measGapSharingConfig-r14	MeasGapSharingConfig-r14	OPTIONAL	Need ON
]],			
[[ frl-Gap-r15	BOOLEAN OPTIONAL,	Need ON	
mgta-r15	BOOLEAN	OPTIONAL	Need ON
]],			
[[ measGapConfigDensePRS-r15	MeasGapConfigDensePRS-r15	OPTIONAL,	- Need ON

heightThreshRef-r15 CHOICE release setup } ]] }	{ NULL, INTEGER (031) OPTIONALNeed ON
MeasIdToRemoveList ::=	SEQUENCE (SIZE (1maxMeasId)) OF MeasId
MeasIdToRemoveListExt-r12 ::=	SEQUENCE (SIZE (1maxMeasId)) OF MeasId-v1250
MeasObjectToRemoveList ::=	SEQUENCE (SIZE (1maxObjectId)) OF MeasObjectId
MeasObjectToRemoveListExt-r13 ::=	SEQUENCE (SIZE (1maxObjectId)) OF MeasObjectId-v1310
ReportConfigToRemoveList ::=	SEQUENCE (SIZE (1maxReportConfigId)) OF ReportConfigId
ASN1STOP	

### MeasConfig field descriptions

### allowInterruptions

Value TRUE indicates that the UE is allowed to cause interruptions to serving cells when performing measurements of deactivated SCell carriers for *measCycleSCell* of less than 640ms, as specified in TS 36.133 [16]. E-UTRAN enables this field only when an SCell is configured.

### fr1-Gap

Indicates whether the gap is only applicable for measurements on FR1. E-UTRAN includes this field only when the UE is configured with (NG)EN-DC.

### heightThreshRef

Reference height threshold for *eventH1* and *eventH2* in *reportConfig.* Value 0 refers to -420m, value 1 refers to - 120m, and so on until value 30 refers to 8880m. The actual value is height in meters relative to sea level. Value 31 is reserved.

### measGapConfig

Used to setup and release measurement gaps. E-UTRAN includes either *measGapConfig* or *measGapConfigPerCC-List*, if any.

### measGapConfigDensePRS

Used to setup and release additional measurement gap pattern with dense PRS configuration as specified in TS 36.133 [16], Table 8.1.2.1-3. E-UTRAN configures this field only when UE indicates the preference of measurement gap configuration for dense PRS, i.e., *measPRS-Offset-r15.* 

### measGapConfigPerCC-List

Used to setup and release serving cell sepecific measurement gaps. E-UTRAN includes either measGapConfig or measGapConfigPerCC-List, if any.

### measGapSharingConfig

Used to setup and release measurement gap sharing for intra- and inter-frequency measurement as specified in TS 36.133 [16].

### measIdToAddModList

List of measurement identities. Field *measIdToAddModListExt* includes additional measurement identities i.e. extends the size of the measurement identity list using the general principles specified in 5.1.2. If E-UTRAN includes *measIdToAddModList-v1310* it includes the same number of entries, and listed in the same order, as in *measIdToAddModList* (i.e. without suffix). If E-UTRAN includes *measIdToAddModListExt-v1310*, it includes the same number of entries, and listed in the same order, as in *measIdToAddModListExt-v1310*, it includes the same number of entries, and listed in the same order, as in *measIdToAddModListExt-v1310*, it includes the same number of entries.

### measIdToRemoveList

List of measurement identities to remove. Field *measIdToRemoveListExt* includes additional measurement identities i.e. extends the size of the measurement identity list using the general principles specified in 5.1.2.

### measObjectToAddModList

If E-UTRAN includes *measObjectToAddModList-v9e0* it includes the same number of entries, and listed in the same order, as in *measObjectToAddModList* (i.e. without suffix). Field *measObjectToAddModListExt* includes additional measurement object identities i.e. extends the size of the measurement object identity list using the general principles specified in 5.1.2.

### measObjectToRemoveList

List of measurement objects to remove. Field *measObjectToRemoveListExt* includes additional measurement object identities i.e. extends the size of the measurement object identity list using the general principles specified in 5.1.2.

### measRSRQ-OnAllSymbols

Value *TRUE* indicates that the UE shall, when performing RSRQ measurements, perform RSRQ measurement on all OFDM symbols in accordance with TS 36.214 [48]. If *widebandRSRQ-Meas* is enabled for the frequency in *MeasObjectEUTRA*, the UE shall, when performing RSRQ measurements, perform RSRQ measurement on all OFDM symbols with wider bandwidth for concerned frequency in accordance with TS 36.214 [48].

### measScaleFactor

Even if *reducedMeasPerformance* is not included in any *measObjectEUTRA* or *measObjectUTRA*, E-UTRAN may configure this field. The UE behavior is specified in TS 36.133 [16].

### MeasConfig field descriptions

# Indicates whether a timing advance value of 0.5 ms is applicable to the measurement gap configuration provided by E-UTRAN according to TS 38.133 [16]. E-UTRAN sets *mgta* to TRUE only when the UE is configured to perform NR measurements. preRegistrationInfoHRPD The CDMA2000 HRPD Pre-Registration Information tells the UE if it should pre-register with the CDMA2000 HRPD network and identifies the Pre-registration zone to the UE. reportConfigToRemoveList List of measurement reporting configurations to remove. s-Measure PCell (or PSCell, if the UE is in NE-DC) quality threshold controlling whether or not the UE is required to perform measurements of intra-frequency, inter-frequency and inter-RAT neighbouring cells. Value "0" indicates to disable s-

Measure. **timeToTrigger-SF** The timeToTrigger in ReportConfigEUTRA and in ReportConfigInterRAT are multiplied with the scaling factor applicable for the UE's speed state.

### MeasDS-Config

The IE MeasDS-Config specifies information applicable for discovery signals measurement.

### MeasDS-Config information elements

```
-- ASN1START
                                 CHOICE {
MeasDS-Config-r12 ::=
    release
                                     NULL,
                                     SEQUENCE {
    setup
        dmtc-PeriodOffset-r12
                                         CHOICE {
                                             INTEGER(0..39),
            ms40-r12
            ms80-r12
                                              INTEGER(0..79)
            ms160-r12
                                              INTEGER(0..159),
            . . .
        },
        ds-OccasionDuration-r12
                                     CHOICE {
            durationFDD-r12
                                         INTEGER(1..maxDS-Duration-r12),
                                         INTEGER(2..maxDS-Duration-r12)
            durationTDD-r12
        },
        measCSI-RS-ToRemoveList-r12 MeasCSI-RS-ToRemoveList-r12 OPTIONAL,
                                                                                -- Need ON
        measCSI-RS-ToAddModList-r12 MeasCSI-RS-ToAddModList-r12 OPTIONAL,
                                                                                -- Need ON
    }
}
MeasCSI-RS-ToRemoveList-r12 ::= SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Id-r12
MeasCSI-RS-ToAddModList-r12 ::= SEQUENCE (SIZE (1..maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Config-r12
MeasCSI-RS-Id-r12 ::=
                                INTEGER (1..maxCSI-RS-Meas-r12)
MeasCSI-RS-Config-r12 ::=
                                SEQUENCE {
   measCSI-RS-Id-r12
                                 MeasCSI-RS-Id-r12,
    physCellId-r12
                                     INTEGER (0..503),
   scramblingIdentity-r12 INTEGER (0..503),
resourceConfig-r12 INTEGER (0..31),
subframeOffact_r12 INTEGER (0..4)
    subframeOffset-r12
                                     INTEGER (0..4),
    csi-RS-IndividualOffset-r12 Q-OffsetRange,
    . . .
}
-- ASN1STOP
```

MeasDS-Config field descriptions	
csi-RS-IndividualOffset	
CSI-RS individual offset applicable to a specific CSI-RS resource. Value dB-24 corresponds to -24 dB, dB-22	
corresponds to -22 dB and so on.	
dmtc-PeriodOffset	
Indicates the discovery signals measurement timing configuration (DMTC) periodicity (dmtc-Periodicity) and offset	
(dmtc-Offset) for this frequency. For DMTC periodicity, value ms40 corresponds to 40ms, ms80 corresponds to 80m	ms
and so on. The value of DMTC offset is in number of subframe(s). The duration of a DMTC occasion is 6ms.	
ds-OccasionDuration	
Indicates the duration of discovery signal occasion for this frequency. Discovery signal occasion duration is commo	n
for all cells transmitting discovery signals on one frequency. If the carrierFreq in the measurement object is on an	
unlicensed band as specified in [42], the UE shall ignore the field ds-OccasionDuration for the carrier frequency an	d
apply a value 1 instead.	
measCSI-RS-ToAddModList	
List of CSI-RS resources to add/ modify in the CSI-RS resource list for discovery signals measurement.	
measCSI-RS-ToRemoveList	
List of CSI-RS resources to remove from the CSI-RS resource list for discovery signals measurement.	
physCellId	
Indicates the physical cell identity where UE may assume that the CSI-RS and the PSS/SSS/CRS corresponding to	0
the indicated physical cell identity are quasi co-located with respect to average delay and doppler shift.	
resourceConfig	
Parameter: CSI reference signal configuration, see TS 36.211 [21], tables 6.10.5.2-1 and 6.10.5.2-2. If the carrierF	
in the measurement object is on an unlicensed band as specified in TS 36.101 [42], E-UTRAN does not configure t	he
values {0, 4, 5, 9, 10, 11, 18, 19}.	
scramblingIdentity	
Parameter: Pseudo-random sequence generator parameter, $n_{ m ID}$ , see TS 36.213 [23], clause 7.2.5.	
subframeOffset	
Indicates the subframe offset between SSS of the cell indicated by physCellId and the CSI-RS resource in a discov	/ery
signal occasion. The field subframeOffset is set to values 0 if the carrierFreq in the measurement object is on an	,
unlicensed band as specified in TS 36.101 [42].	

### MeasGapConfig

_

The IE MeasGapConfig specifies the measurement gap configuration and controls setup/ release of measurement gaps.

### MeasGapConfig information element

ASN1START				
MeasGapConfig : release setup gapOffs		CHOICE { NULL, SEQUENCE { CHOICE		(039), (079),
}	<pre>gp2-r14 gp3-r14 gp-ncsg0-r14 gp-ncsg1-r14 gp-ncsg2-r14 gp-ncsg3-r14 gp-nonUniform1-r14 gp-nonUniform3-r14 gp-nonUniform4-r14 gp4-r15 gp5-r15 gp6-r15 gp7-r15 gp8-r15 gp9-r15 gp1-r15</pre>		INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER INTEGER	<pre>(039), (079), (039), (039), (079), (01279), (02559), (05119), (010239), (019), (019), (019), (039), (079), (0159), (019), (0159),</pre>

-- ASN1STOP

### MeasGapConfig field descriptions

gapOffset Value gapOffset of gp0 corresponds to gap offset of Gap Pattern Id "0" with MGRP = 40ms, gapOffset of gp1 corresponds to gap offset of Gap Pattern Id "1" with MGRP = 80ms, gapOffset of gp2 corresponds to gap offset of Gap Pattern Id "2" with MGRP = 40ms and MGL = 3ms, gapOffset of gp3 Gap Pattern Id "3" with MGRP = 80ms and MGL = 3ms, gapOffset of gp-ncsg0 corresponds to gap offset of NCSG Pattern Id "0" with VIRP = 40ms and ML = 4ms, gapOffset of gp-ncsg1 corresponds to gap offset of of NCSG Pattern Id "1" with VIRP = 80ms and ML = 4ms, gapOffset of gp-ncsg2 corresponds to gap offset of NCSG Pattern Id "2" with VIRP = 40ms and ML = 3ms, gapOffset of gp-ncsg3 corresponds to gap offset of of NCSG Pattern Id "3" with VIRP = 80ms and ML =3ms. gapOffset of gpnonUniform1 corresponds to gap offset of non uniform gap pattern Id "1" with LMGRP = 1280ms, gapOffset of gp-nonUniform2 corresponds to gap offset of non uniform gap pattern Id "2" with LMGRP = 2560ms, gapOffset of gpnonUniform3 corresponds to gap offset of non uniform gap pattern Id "3" with LMGRP = 5120ms, gapOffset of gpnonUniform4 corresponds to gap offset of non uniform gap pattern Id "4" with LMGRP = 10240ms. Also used to specify the measurement gap pattern to be applied, as defined in TS 36.133 [16]. For Gap Patterns (including nonuniform gap patterns, but excluding NCSG patterns), E-UTRAN includes the same gapOffset value (gap pattern id and gap offset) for all serving cells that are configured with a Gap Pattern. For NCSG Patterns, E-UTRAN includes gapOffset value indicating VIRP and gap offset consistent with the Gap Pattern configuration (MGRP and gap offset). Value gapOffset of gp4, gp5,...,gp11 are corresponding to gap pattern with Gap Pattern ID 4, 5,..11 respectively, see TS 38.133 [84], Table 9.1.2-1. Value gp4, gp5, ..., gp11 can be applied for (NG)EN-DC, see TS 38.133 [84], Table 9.1.2-2.

### servCellId

Identifies the serving cell for which measurement gap configuration is provided (setup) or deleted (release).

_

### MeasGapConfigDensePRS

The IE *MeasGapConfigDensePRS* specifies the additional measurement gap pattern configuration for RSTD measurements with dense PRS configuration, see TS 36.133 [16], Table 8.1.2.1-3. Measurement gaps are configured according to applicability rules specified in 36.133 [16], Table 8.1.2.1-3.

### MeasGapConfigDensePRS information element

ASN1START	
MeasGapConfigDensePRS-r15 ::= release	CHOICE { NULL,
setup	SEQUENCE {
gapOffsetDensePRS-r15	CHOICE {
rstd0-r15	INTEGER (079),
rstd1-r15	INTEGER (0159),
rstd2-r15	INTEGER (0319),
rstd3-r15	INTEGER (0639),
rstd4-r15	INTEGER (01279),
rstd5-r15	INTEGER (0159),
rstd6-r15	INTEGER (0319),
rstd7-r15	INTEGER (0639),
rstd8-r15	INTEGER (01279),
rstd9-r15	INTEGER (0319),
rstd10-r15	INTEGER (0639),
rstdll-r15	INTEGER (01279),
rstd12-r15	INTEGER (0319),
rstd13-r15	INTEGER (0639),
rstd14-r15	INTEGER (01279),
rstd15-r15	INTEGER (0639),
rstd16-r15	INTEGER (01279),
rstd17-r15	INTEGER (0639),
rstd18-r15	INTEGER (01279),
rstd19-r15	INTEGER (0639),
rstd20-r15	INTEGER (01279),
· · · ·	
}	
}	
}	
ASN1STOP	

### MeasGapConfigDensePRS field descriptions

### gapOffsetDensePRS

Indicates the gap offset for performing RSTD measurements with dense PRS configurations as specified in 5.5.2.9a corresponding to measurement gap pattern ID specified in TS 36.133 [16].

### MeasGapConfigPerCC-List

The IE *MeasGapConfigPerCC-List* specifies the measurement gap configuration and controls setup/ release of measurement gaps.

### MeasGapConfigPerCC-List information element

```
-- ASN1START
MeasGapConfigPerCC-List-r14 ::= CHOICE {
    release
                               NULL,
    setup
                               SEOUENCE {
       measGapConfigToRemoveList-r14 MeasGapConfigToRemoveList-r14
                                                                       OPTIONAL,
                                                                                   -- Need ON
       measGapConfigToAddModList-r14 MeasGapConfigToAddModList-r14 OPTIONAL
                                                                                   -- Need ON
    }
}
MeasGapConfigToRemoveList-r14 ::=
                                  SEQUENCE (SIZE (1..maxServCell-r13)) OF ServCellIndex-r13
MeasGapConfigToAddModList-r14 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasGapConfigPerCC-r14
MeasGapConfigPerCC-r14 ::= SEQUENCE {
                               ServCellIndex-r13,
    servCellId-r14
    measGapConfigCC-r14
                               MeasGapConfig
}
```

-- ASN1STOP

### MeasGapConfigPerCC-List field descriptions

*measGapConfigToAddModList* List of serving cells and corresponding serving cell specific measurement gap configuration to add /modify. *measGapConfigToRemoveList* List of serving cells for which measurement gap configuration is removed.

### MeasGapSharingConfig

The IE *MeasGapSharingConfig* specifies the measurement gap sharing scheme and controls setup/ release of measurement gap sharing.

### MeasGapSharingConfig information element

```
-- ASN1START
MeasGapSharingConfig-r14 ::= CHOICE {
   release NULL,
   setup SEQUENCE {
    measGapSharingScheme-r14 ENUMERATED {scheme00, scheme10, scheme11}
   }
}
-- ASN1STOP
```

### MeasGapSharingConfig field descriptions

*measGapSharingScheme* Indicates the measurement gaps sharing scheme for BL UEs in CE mode A and CE mode B and for (NG)EN-DC (for the measurement gap configured by E-UTRAN). For BL UEs, see TS 36.133 [16], Table 8.13.2.1.1.1-2 and Table 8.13.3.1.1.1-3. For (NG)EN-DC, see TS 36.133 [16], Table 8.17.1.1-1. Value *scheme00* corresponds to "00", value *scheme01* corresponds to "01", and so on.

### Measld

The IE *MeasId* is used to identify a measurement configuration, i.e., linking of a measurement object and a reporting configuration.

### MeasId information element

ASNISIARI		
MeasId ::=	INTEGER	(1maxMeasId)
MeasId-v1250 ::=	INTEGER	(maxMeasId-Plus1maxMeasId-r12)
ASN1STOP		

### MeasIdleConfig

The IE *MeasIdleConfig* is used to convey information to UE about measurements requested to be done while in RRC_IDLE or RRC_INACTIVE.

### MeasIdleConfig information element

```
-- ASN1START
MeasIdleConfigSIB-r15 ::= SEQUENCE {
    measIdleCarrierListEUTRA-r15
                                           EUTRA-CarrierList-r15,
}
MeasIdleConfigDedicated-r15 ::= SEQUENCE {
    measIdleCarrierListEUTRA-r15 EUTRA-CarrierList-r15
                                                                                     OPTIONAL, -- Need OR
     measIdleDuration-r15 ENUMERATED {sec10, sec30, sec60, sec120,
                                                        sec180, sec240, sec300, spare},
     . . .
}
EUTRA-CarrierList-r15 ::= SEQUENCE (SIZE (1..maxFreqIdle-r15)) OF MeasIdleCarrierEUTRA-r15
MeasIdleCarrierEUTRA-r15::= SEQUENCE {
    CallerFreq-r15ARFCN-ValueEUTRA-r9,allowedMeasBandwidth-r15AllowedMeasBandwidth,validityArea-r15CellList-r15measCellList-r15CellList-r15
    carrierFreq-r15
                                                                                     OPTIONAL,
                                                                                                     -- Need OR
    Incustor F15CellList-r15reportQuantitiesENUMERATED {rsrp, rsrq, both},qualityThreshold-r15SEQUENCE {idleRSRP-Threshold-r15RSRP-RangeidleRSRQ-Threshold-r15RSRQ-Range-r13
                                                                                                    -- Need OR
                                                                                     OPTIONAL.
                                                                                    OPTIONAL,
                                                                                                    -- Need OR
                                                                                     OPTIONAL
                                                                                                    -- Need OR
                                                                                                  -- Need OP
    }
                                                                                      OPTIONAL.
     . . .
}
CellList-r15 ::=
                            SEQUENCE (SIZE (1.. maxCellMeasIdle-r15)) OF PhysCellIdRange
-- ASN1STOP
```

MeasIdleConfig field descriptions
allowedMeasBandwidth
If absent, the value corresponding to the downlink bandwidth indicated by the <i>dl-Bandwidt</i> h included in
MasterInformationBlock of serving cell applies.
carrierFreq
Indicates the E-UTRA carrier frequency to be used for measurements during RRC_IDLE or RRC_INACTIVE mode.
measIdleCarrierListEUTRA
Indicates the E-UTRA carriers to be measured during RRC_IDLE or RRC_INACTIVE mode.
measIdleDuration
Indicates the duration for performing measurements during RRC_IDLE or RRC_INACTIVE mode for measurements
assigned via <i>RRCConnectionRelease</i> . Value sec10 correspond to 10 seconds, value sec30 to 30 seconds and so on.
qualityThreshold
Indicates the quality thresholds for reporting the measured cells for IDLE mode measurements. If absent, PCell and
up to maxCellMeasIdle strongest identified cells are considered for idle mode measurement reporting.
reportQuantities
Indicates which measurment quantities UE is requested to report in the idle mode measurement report.
measCellList
Indicates the list of cells which the UE is requested to measure and report for IDLE mode measurements.
validityArea
Indicates the list of cells within which UE is requested to do IDLE mode measurements. If the UE reselects to a cell
whose physical cell identity does not match any entry in validityArea for the corresponding carrier frequency, the
measurements are no longer required. E-UTRAN configures this field only in RRCConnectionRelease.

### MeasIdToAddModList

The IE *MeasIdToAddModList* concerns a list of measurement identities to add or modify, with for each entry the *measId*, the associated *measObjectId* and the associated *reportConfigId*. Field *measIdToAddModListExt* includes additional measurement identities i.e. extends the size of the measurement identity list using the general principles specified in 5.1.2.

### MeasIdToAddModList information element

```
-- ASN1START
MeasIdToAddModList ::=
                                    SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddMod
MeasIdToAddModList-v1310 ::=
                                    SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddMod-v1310
MeasIdToAddModListExt-r12 ::=
                                    SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddModExt-r12
MeasIdToAddModListExt-v1310 ::=
                                    SEQUENCE (SIZE (1..maxMeasId)) OF MeasIdToAddMod-v1310
MeasIdToAddMod ::= SEQUENCE {
   measId
                                        MeasId,
    measObjectId
                                        MeasObjectId,
   reportConfigId
                                        ReportConfigId
}
MeasIdToAddModExt-r12 ::= SEQUENCE {
   measId-v1250
                                        MeasId-v1250,
   measObjectId-r12
                                        MeasObjectId,
   reportConfigId-r12
                                       ReportConfigId
}
MeasIdToAddMod-v1310 ::=
                           SEQUENCE {
                                MeasObjectId-v1310
                                                        OPTIONAL
    measObjectId-v1310
}
-- ASN1STOP
```

measObjectId

### MeasIdToAddModList field descriptions

If the measObjectId-v1310 is included, the measObjectId or measObjectId-r12 is ignored by the UE.

### MeasObjectCDMA2000

The IE MeasObjectCDMA2000 specifies information applicable for inter-RAT CDMA2000 neighbouring cells.

### MeasObjectCDMA2000 information element

```
-- ASN1START
MeasObjectCDMA2000 ::=
                                SEQUENCE {
   cdma2000-Type
                                    CDMA2000-Type,
                                     CarrierFreqCDMA2000,
   carrierFreq
   searchWindowSize
                                                                     OPTIONAL,
DEFAULT 0,
OPTIONAL,
                                     INTEGER (0..15)
                                                                                    -- Need ON
                                     Q-OffsetRangeInterRAT
   offsetFreq
   cellsToRemoveList
                                     CellIndexList
                                                                                    -- Need ON
                                    CellsToAddModListCDMA2000
PhysCellIdCDMA2000
   cellsToAddModList
                                                                       OPTIONAL,
                                                                                   -- Need ON
   cellForWhichToReportCGI
                                                                                   -- Need ON
                                                                        OPTIONAL,
   . . .
}
CellsToAddModListCDMA2000 ::=
                                 SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModCDMA2000
CellsToAddModCDMA2000 ::= SEQUENCE {
   cellIndex
                                      INTEGER (1..maxCellMeas),
   physCellId
                                      PhysCellIdCDMA2000
}
```

```
-- ASN1STOP
```

MeasObjectCDMA2000 field descriptions
carrierInfo
Identifies CDMA2000 carrier frequency for which this configuration is valid.
cdma2000-Type
The type of CDMA2000 network: CDMA2000 1xRTT or CDMA2000 HRPD.
cellIndex
Entry index in the neighbouring cell list.
cellsToAddModList
List of cells to add/ modify in the neighbouring cell list.
cellsToRemoveList
List of cells to remove from the neighbouring cell list.
physCellId
CDMA2000 Physical cell identity of a cell in neighbouring cell list expressed as PNOffset.
searchWindowSize
Provides the search window size to be used by the UE for the neighbouring pilot, see C.S0005 [25].

### MeasObjectEUTRA

The IE MeasObjectEUTRA specifies information applicable for intra-frequency or inter-frequency E-UTRA cells.

### MeasObjectEUTRA information element

ASN1START		
MeasObjectEUTRA ::= carrierFreq allowedMeasBandwidth presenceAntennaPort1 neighCellConfig	<pre>SEQUENCE {     ARFCN-ValueEUTRA,     AllowedMeasBandwidth,     PresenceAntennaPort1,     NeighCellConfig,</pre>	
offsetFreq Cell list	Q-OffsetRange	DEFAULT dB0,
cellsToRemoveList cellsToAddModList Black list	CellIndexList CellsToAddModList	OPTIONAL, Need ON OPTIONAL, Need ON
blackCellsToRemoveList blackCellsToAddModList cellForWhichToReportCGI	CellIndexList BlackCellsToAddModList PhysCellId	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON
, [[measCycleSCell-r10 measSubframePatternConfigNe: Need ON ]],	MeasCycleSCell-r10 C igh-r10 MeasSubframePatternCc	OPTIONAL, Need ON onfigNeigh-r10 OPTIONAL

```
[[widebandRSRQ-Meas-r11 BOOLEAN OPTIONAL -- Cond WB-RSRQ
    ]],
[[ altTTT-CellsToRemoveList-r12 CellIndexList
                                                                       OPTIONAL,
                                                                                       -- Need ON
                                                                                           -- Need ON
        altTTT-CellsToAddModList-r12 AltTTT-CellsToAddModList-r12 OPTIONAL,
        t312-r12
                                         CHOICE {
           release
                                              NULL.
                                              ENUMERATED {ms0, ms50, ms100, ms200,
            setup
                                              ms300, ms400, ms500, ms1000}
                                                          OPTIONAL, -- Need ON
OPTIONAL, -- Need ON
        }
        }
reducedMeasPerformance-r12
                                         MeasDS-Config-r12 OPTIONAL,
                                                                    OPTIONAL
        measDS-Config-r12
                                                                                         -- Need ON
    11,
    11
        whiteCellsToRemoveList-r13CellIndexListOPTIONAL,-- NwhiteCellsToAddModList-r13WhiteCellsToAddModList-r13OPTIONAL,-- Nrmtc-Config-r13RMTC-Config-r13OPTIONAL,-- Need ONcarrierFreq-r13ARFCN-ValueEUTRA-v9e0OPTIONAL
                                                                                         -- Need ON
                                                                                        -- Need ON
        carrierFreq-r13
                                        ARFCN-ValueEUTRA-v9e0 OPTIONAL
                                                                                             -- Need ON
    ]],
    [[
        tx-ResourcePoolToRemoveList-r14 Tx-ResourcePoolMeasList-r14 OPTIONAL, -- Need ON
tx-ResourcePoolToAddList-r14 Tx-ResourcePoolMeasList-r14 OPTIONAL, -- Need ON
fembms-MixedCarrier-r14 BOOLEAN OPTIONAL -- Need ON
                                                                       OPTIONAL
        fembms-MixedCarrier-r14
                                             BOOLEAN
                                                                                             -- Need ON
    ]],
    ]]
                                        MeasSensing-Config-r15
        measSensing-Config-r15
                                                                     OPTIONAL
                                                                                       -- Need ON
    11
}
MeasObjectEUTRA-v9e0 ::= SEQUENCE {
                                         ARFCN-ValueEUTRA-v9e0
    carrierFreq-v9e0
}
CellsToAddModList ::=
                                     SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddMod
CellsToAddMod ::= SEQUENCE {
    cellIndex
                                          INTEGER (1..maxCellMeas),
    physCellId
                                        PhysCellId,
    cellIndividualOffset
                                         0-OffsetRange
}
BlackCellsToAddModList ::=
                                    SEQUENCE (SIZE (1..maxCellMeas)) OF BlackCellsToAddMod
BlackCellsToAddMod ::= SEQUENCE {
    cellIndex
                                         INTEGER (1..maxCellMeas),
    physCellIdRange
                                         PhysCellIdRange
}
MeasCycleSCell-r10 ::=
                                    ENUMERATED {sf160, sf256, sf320, sf512,
                                                      sf640, sf1024, sf1280, spare1}
MeasSubframePatternConfigNeigh-r10 ::= CHOICE {
   release
                                            NULL,
                                              SEQUENCE {
   setup
        up
measSubframePatternNeigh-r10
                                                  MeasSubframePattern-r10,
                                             MeasSubframePattern-110,
MeasSubframeCellList-r10 OPTIONAL -- Cond
        measSubframeCellList-r10
always
    }
}
MeasSubframeCellList-r10 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF PhysCellIdRange
AltTTT-CellsToAddModList-r12 ::=
                                   SEQUENCE (SIZE (1..maxCellMeas)) OF AltTTT-CellsToAddMod-r12
AltTTT-CellsToAddMod-r12 ::= SEQUENCE {
                                              INTEGER (1..maxCellMeas),
   cellIndex-r12
    physCellIdRange-r12
                                              PhysCellIdRange
}
WhiteCellsToAddModList-r13 ::= SEQUENCE (SIZE (1..maxCellMeas)) OF WhiteCellsToAddMod-r13
WhiteCellsToAddMod-r13 ::= SEQUENCE {
   cellIndex-r13
                                              INTEGER (1..maxCellMeas),
    physCellIdRange-r13
                                              PhysCellIdRange
}
RMTC-Config-r13 ::= CHOICE {
   release
                                          NULL.
                                          SEQUENCE {
   setup
```

```
rmtc-Period-r13 ENUMERATED {ms40, ms80, ms160, ms320, ms640},
rmtc-SubframeOffset-r13 INTEGER(0..639) OPTIONAL, -- Need ON
measDuration-r13 ENUMERATED {sym1, sym14, sym28, sym42, sym70},
...
}
Tx-ResourcePoolMeasList-r14 ::= SEQUENCE (SIZE (1..maxSL-PoolToMeasure-r14)) OF SL-V2X-
TxPoolReportIdentity-r14
```

-- ASN1STOP

MeasObjectEUTRA field descriptions	
altTTT-CellsToAddModList	
List of cells to add/ modify in the cell list for which the alternative time to trigger specified by alternativeTime	ToTrigger
in reportConfigEUTRA, if configured, applies. altTTT-CellsToRemoveList	
List of cells to remove from the list of cells for alternative time to trigger.	
blackCellsToAddModList	
List of cells to add/ modify in the black list of cells.	
blackCellsToRemoveList	
List of cells to remove from the black list of cells.	
carrierFreq	a
Identifies E-UTRA carrier frequency for which this configuration is valid. E-UTRAN does not configure more measurement object for the same physical frequency regardless of the E-ARFCN used to indicate this. Carri	
r13 is included only when the extension list measObjectToAddModListExt-r13 is used. If <i>carrierFreq-r13</i> is p	resent.
carrierFreq (i.e., without suffix) shall be set to value maxEARFCN.	roooni,
cellIndex	
Entry index in the cell list. An entry may concern a range of cells, in which case this value applies to the entit	re range.
cellIndividualOffset	
Cell individual offset applicable to a specific cell. Value dB-24 corresponds to -24 dB, dB-22 corresponds to	-22 dB
and so on. cellsToAddModList	
List of cells to add/ modify in the cell list.	
cellsToRemoveList	
List of cells to remove from the cell list.	
fembms-MixedCarrier	
If this field is set to TRUE, the cells on the carrier frequency indicated by the measObject are FeMBMS/Unic	ast-mixed
cells.	
measCycleSCell	
The parameter is used only when an SCell is configured on the frequency indicated by the measObject and deactivated state, see TS 36.133 [16], clause 8.3.3. E-UTRAN configures the parameter whenever an SCell	
configured on the frequency indicated by the <i>measObject</i> , but the field may also be signalled when an SCell	
configured. Value <i>sf160</i> corresponds to 160 sub-frames, <i>sf256</i> corresponds to 256 sub-frames and so on.	13 1101
measDS-Config	
Parameters applicable to discovery signals measurement on the carrier frequency indicated by carrierFreq.	
measDuration	
Number of consecutive symbols for which the Physical Layer reports samples of RSSI, see TS 36.214 [48].	Value
sym1 corresponds to one symbol, sym14 corresponds to 14 symbols, and so on.	
measSubframeCellList List of cells for which measSubframePatternNeigh is applied.	
measSubframePatternNeigh	
Time domain measurement resource restriction pattern applicable to neighbour cell RSRP and RSRQ meas	urements
on the carrier frequency indicated by <i>carrierFreq</i> . For cells in <i>measSubframeCellList</i> the UE shall assume th	at the
subframes indicated by measSubframePatternNeigh are non-MBSFN subframes, and have the same specia	
subframe configuration as PCell.	
offsetFreq	
Offset value applicable to the carrier frequency. Value dB-24 corresponds to -24 dB, dB-22 corresponds to -	22 dB and
so on.	
physCellId Devoiced cell identity of a cell in the cell list	
Physical cell identity of a cell in the cell list. physCellIdRange	
Physical cell identity or a range of physical cell identities.	
reducedMeasPerformance	
If set to TRUE, the EUTRA carrier frequency is configured for reduced measurement performance, otherwise	e it is
configured for normal measurement performance, see TS 36.133 [16].	
rmtc-Config	
Parameters applicable to RSSI and channel occupancy measurement on the carrier frequency indicated by	
carrierFreq.	
rmtc-Period	roenanda
Indicates the RSSI measurement timing configuration (RMTC) periodicity for this frequency. Value <i>ms40</i> cor to 40 ms periodicity, <i>ms80</i> corresponds to 80 ms periodicity and so on, see TS 36.214 [48].	responds
rmtc-SubframeOffset	
Indicates the RSSI measurement timing configuration (RMTC) subframe offset for this frequency. The value	of rmtc-
SubframeOffset should be smaller than the value of <i>rmtc-Period</i> , see TS 36.214 [48]. For inter-frequency	5
measurements, this field is optional present and if it is not configured, the UE chooses a random value as <i>rn</i>	ntc-
SubframeOffset for measDuration which shall be selected to be between 0 and the configured rmtc-Period w	nui equai

MeasObjectEUTRA field descriptions
t312
The value of timer T312. Value ms0 represents 0 ms, ms50 represents 50 ms and so on.
tx-ResourcePoolToAddList
List of transmission pools identities to be added to the list of pools configured for CBR measurements and for which poolReportId is included in SL-V2X-ConfigDedicated, SystemInformationBlockType21 or
SystemInformationBlockType26.
tx-ResourcePoolToRemoveList
List of transmission resource pools identities to be removed from the list of pools configured for CBR measurements and for which <i>poolReportId</i> is included in <i>SL-V2X-ConfigDedicated</i> , <i>SystemInformationBlockType21</i> or
SystemInformationBlockType26.
widebandRSRQ-Meas
If this field is set to TRUE, the UE shall, when performing RSRQ measurements, use a wider bandwidth in accordance
with TS 36.133 [16].
whiteCellsToAddModList
List of cells to add/modify in the white list of cells.
whiteCellsToRemoveList
List of cells to remove from the white list of cells.

Conditional presence	Explanation
always	The field is mandatory present.
WB-RSRQ	The field is optionally present, need ON, if the measurement bandwidth indicated by <i>allowedMeasBandwidth</i> is 50 resource blocks or larger; otherwise it is not present and the UE shall delete any existing value for this field, if configured.

### MeasObjectGERAN

The IE MeasObjectGERAN specifies information applicable for inter-RAT GERAN neighbouring frequencies.

SEQUENCE {

### MeasObjectGERAN information element

```
-- ASN1START
```

MeasObjectGERAN ::=
 carrierFreqs
 offsetFreq
 ncc-Permitted
 cellForWhichToReportCGI
 ...
}

CarrierFreqsGERAN, Q-OffsetRangeInterRAT BIT STRING(SIZE (8)) PhysCellIdGERAN

DEFAULT 0, DEFAULT '11111111'B, OPTIONAL, -- Need ON

-- ASN1STOP

#### MeasObjectGERAN field descriptions

*ncc-Permitted* Field encoded as a bit map, where bit N is set to "0" if a BCCH carrier with NCC = N-1 is not permitted for monitoring and set to "1" if a BCCH carrier with NCC = N-1 is permitted for monitoring; N = 1 to 8; bit 1 of the bitmap is the leading bit of the bit string. *carrierFreqs* 

If E-UTRAN includes cellForWhichToReportCGI, it includes only one GERAN ARFCN value in carrierFreqs.

—

### MeasObjectId

The IE MeasObjectId used to identify a measurement object configuration.

#### MeasObjectId information element

ASN1START	
MeasObjectId ::=	INTEGER (1maxObjectId)
MeasObjectId-v1310 ::=	<pre>INTEGER (maxObjectId-Plus1-r13maxObjectId-r13)</pre>
MeasObjectId-r13 ::=	INTEGER (1maxObjectId-r13)

-- ASN1STOP

### MeasObjectNR

The IE MeasObjectNR specifies information applicable for inter-RAT NR neighbouring cells.

#### MeasObjectNR information element

```
-- ASN1START
MeasObjectNR-r15 ::=
                                               SEQUENCE {
    carrierFreq-r15
                                                    ARFCN-ValueNR-r15,
     rs-ConfigSSB-r15
                                                    RS-ConfigSSB-NR-r15,
                                                    RS-ConfigSSB-NK-ris,
ThresholdListNR-r15 OPTIONAL,
MaxRS-IndexCellQualNR-r15 OPTIONAL,
Q-OffsetRangeInterRAT DEFAULT 0,
     threshRS-Index-r15
                                                                                                                    -- Need OR
     maxRS-IndexCellQual-r15
                                                                                                                     -- Need OR
    Marker Indexcerriguar FisMarker Indexcerriguar FisOPTIONAL,-- NeoffsetFreq-r15Q-OffsetRangeInterRATDEFAULT 0,blackCellsToRemoveList-r15CellIndexListOPTIONAL,-- NeblackCellsToAddModList-r15CellsToAddModListNR-r15OPTIONAL,-- NequantityConfigSet-r15INTEGER (1.. maxQuantSetsNR-r15),seQUENCE (SIZE (1..maxCellSFTD)) OF PhysCellIdNR-r15OPTIONAL-- Ne
                                                                                                                    -- Need ON
                                                                                                                    -- Need ON
    OPTIONAL,
                   -- Need OR
     ...,
[[ cellForWhichToReportCGI-r15 PhysCell
deriveSSB-IndexFromCell-r15 BOOLEAN
SS-RSSI
                                                         PhysCellIdNR-r15
                                                                                                    OPTIONAL,
                                                                                                                    -- Need ON
                                                                                                    OPTIONAL, -- Need ON
          ss-RSSI-Measurement-r15
                                                         SS-RSSI-Measurement-r15
                                                                                                    OPTIONAL,
                                                                                                                   -- Need ON
                                              CHOICE {
          bandNR-r15
               release
                                                  NULL,
               setup
                                                    FreqBandIndicatorNR-r15
                                                                                                               -- Need ON
          }
                                                                                               OPTIONAL
     11
}
    contigSSB-NR-r15 ::=
measTimingConfig-r15
RS-ConfigSSB-NR-r15 ::=
                                         SEQUENCE {
                                            MTC-SSB-NR-r15,
     subcarrierSpacingSSB-r15 ENUMERATED {kHz15, kHz30, kHz120, kHz240},
     [[ ssb-ToMeasure-r15
                                               CHOICE {
               release
                                                    NULT.
               setup
                                                     SSB-ToMeasure-r15
          }
                                                                    OPTIONAL
                                                                                    -- Need ON
     ]]
}
CellsToAddModListNR-r15 ::=
                                               SEQUENCE (SIZE (1..maxCellMeas)) OF CellsToAddModNR-r15
CellsToAddModNR-r15 ::=
                                       SEQUENCE {
     cellIndex-r15
                                               INTEGER (1..maxCellMeas),
     physCellId-r15
                                               PhysCellIdNR-r15
}
```

-- ASN1STOP

#### MeasObjectNR field descriptions

#### bandNR

Indicates the frequency band of the NR carrier frequency configured in this *MeasObjectNR*. This field is always set to setup when the network configures measurements with this *MeasObjectNR*.

### carrierFreq

Identifies the SSB frequency to be measured. E-UTRAN does not configure more than one measurement object for the same SSB frequency.

### deriveSSB-IndexFromCell

The field indicates whether the UE may use, to derive the SSB index of a cell on the indicated SSB frequency and subcarrier spacing, the timing of the NR serving cell with the same SSB frequency and subcarrier spacing if configured. Otherwise, the field indicates whether the UE may use the timing of any detected cell with the same SSB frequency and subcarrier spacing.

#### quantityConfigSet

Indicates the n-th element of quantityConfigNRList provided in MeasConfig.

rs-ConfigSSB

Indicates the SSB configuration for measuring the set of SS blocks within the SMTC measurement duration. *threshRS-Index* 

List of thresholds for consolidation of L1 measurements per RS index.

### MeasObjectToAddModList

The IE MeasObjectToAddModList concerns a list of measurement objects to add or modify

#### MeasObjectToAddModList information element

```
-- ASN1START
```

```
MeasObjectToAddModList ::=
                                    SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod
MeasObjectToAddModListExt-r13 ::=
                                    SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddModExt-r13
MeasObjectToAddModList-v9e0 ::=
                                    SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod-v9e0
MeasObjectToAddMod ::= SEQUENCE {
    measObjectId
                                         MeasObjectId,
   measObject
                                         CHOICE {
                                            MeasObjectEUTRA,
       measObjectEUTRA
        measObjectUTRA
                                            MeasObjectUTRA,
        measObjectGERAN
                                            MeasObjectGERAN
        measObjectCDMA2000
                                            MeasObjectCDMA2000,
        measObjectWLAN-r13
                                            MeasObjectWLAN-r13,
        measObjectNR-r15
                                            MeasObjectNR-r15
    }
}
MeasObjectToAddModExt-r13 ::=
                                SEQUENCE {
    measObjectId-r13
                                        MeasObjectId-v1310,
    measObject-r13
                                            CHOICE {
                                                 MeasObjectEUTRA,
        measObjectEUTRA-r13
        measObjectUTRA-r13
                                                 MeasObjectUTRA,
        measObjectGERAN-r13
                                                 MeasObjectGERAN,
        measObjectCDMA2000-r13
                                                 MeasObjectCDMA2000,
        . . .
        measObjectWLAN-v1320
                                                 MeasObjectWLAN-r13,
        measObjectNR-r15
                                                 MeasObjectNR-r15
    }
}
MeasObjectToAddMod-v9e0 ::= SEQUENCE {
    measObjectEUTRA-v9e0
                                         MeasObjectEUTRA-v9e0
                                                                     OPTIONAL
                                                                                  -- Cond eutra
}
-- ASN1STOP
```

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Conditional presence	Explanation
eutra	The field is optional present, need OR, if for the corresponding entry in MeasObjectToAddModList or MeasObjectToAddModListExt-r13 field measObject is set to
	measObjectEUTRA and its sub-field carrierFreq is set to maxEARFCN. Otherwise the field is not present and the UE shall delete any existing value for this field.

# MeasObjectUTRA

The IE MeasObjectUTRA specifies information applicable for inter-RAT UTRA neighbouring cells.

### MeasObjectUTRA information element

ASN1START				
MeasObjectUTRA ::= SE(	DUENCE {			
carrierFreq	ARFCN-ValueUTRA,			
offsetFreq	Q-OffsetRangeInterRAT	DEFAULT 0,		
cellsToRemoveList	CellIndexList	OPTIONAL,	Ne	ed ON
cellsToAddModList	CHOICE {			
cellsToAddModListUTRA-FDD	CellsToAddModListUTRA-H	DD,		
cellsToAddModListUTRA-TDD	CellsToAddModListUTRA-1	DD		
}		OPTIONAL,	Ne	ed ON
cellForWhichToReportCGI	CHOICE {			
utra-FDD	PhysCellIdUTRA-FDD,			
utra-TDD	PhysCellIdUTRA-TDD			
}		OPTIONAL,	Need ON	
		a 11 o	0000000	
[[ csg-allowedReportingCells-v930	CSG-AllowedReportir	igCells-r9	OPTIONAL	
Need ON				
]], [[ reducedMeasPerformance-r12	BOOLEAN OPT	TIONAL	Need ON	
	BOOLLAIN OP 1	TOWAL	Need ON	
}				
J				
CellsToAddModListUTRA-FDD ::= SE(	OUENCE (SIZE (1maxCellMeas)	) OF CellsTo	AddModUTRA-FDD	
		,		
CellsToAddModUTRA-FDD ::= SEQUENCE {				
cellIndex	INTEGER (1maxCellMeas),			
physCellId	PhysCellIdUTRA-FDD			
}	-			
CellsToAddModListUTRA-TDD ::= SE(	QUENCE (SIZE (1maxCellMeas)	) OF CellsTo	AddModUTRA-TDD	
CellsToAddModUTRA-TDD ::= SEQUENCE {				
cellIndex	<pre>INTEGER (1maxCellMeas),</pre>			
physCellId	PhysCellIdUTRA-TDD			
}				
CSG-AllowedReportingCells-r9 ::=	SEQUENCE {			1 07
physCellIdRangeUTRA-FDDList-r9	PhysCellIdRangeUTRA-FDI	DLIST-TY OPT	IONAL Ne	ed OR
} ASN1STOP				
ADNIDIOP				

MeasObjectUTRA field descriptions
carrierFreq
Identifies UTRA carrier frequency for which this configuration is valid. E-UTRAN does not configure more than one
measurement object for the same physical frequency regardless of the ARFCN used to indicate this.
cellIndex
Entry index in the neighbouring cell list.
cellsToAddModListUTRA-FDD
List of UTRA FDD cells to add/ modify in the neighbouring cell list.
cellsToAddModListUTRA-TDD
List of UTRA TDD cells to add/modify in the neighbouring cell list.
cellsToRemoveList
List of cells to remove from the neighbouring cell list.
csg-allowedReportingCells
One or more ranges of physical cell identities for which UTRA-FDD reporting is allowed.
reducedMeasPerformance
If set to TRUE the UTRA carrier frequency is configured for reduced measurement performance, otherwise it is
configured for normal measurement performance, see TS 36.133 [16].

### MeasObjectWLAN

The IE *MeasObjectWLAN* specifies information applicable for inter-RAT WLAN measurements. E-UTRAN configures at least one WLAN identifier in the *MeasObjectWLAN*.

-- ASN1START MeasObjectWLAN-r13 ::= SEQUENCE { carrierFreq-r13 CHOICE { SEQUENCE (SIZE (1..maxWLAN-Bands-r13)) OF WLANbandIndicatorListWLAN-r13 BandIndicator-r13, carrierInfoListWLAN-r13 SEQUENCE (SIZE (1..maxWLAN-CarrierInfo-r13)) OF WLAN-CarrierInfo-r13 OPTIONAL, -- Need ON OAddModList-r13 WLAN-Id-List-r13 OPemovelist-r13 WLAN-Id-List-r13 } wlan-ToAddModList-r13 OPTIONAL, -- Need ON WLAN-Id-List-r13 OPTIONAL, wlan-ToRemoveList-r13 -- Need ON } WLAN-BandIndicator-r13 ::= ENUMERATED {band2dot4, band5, band60-v1430, spare5, spare4, spare3, spare2, spare1, ...}

-- ASN1STOP

#### MeasObjectWLAN field descriptions

 bandIndicatorListWLAN

 Includes the list of WLAN bands. Value band2dot4 indicates the 2.4GHz band, value band5 indicates the 5GHz band and value band60 indicates the 60GHz band.

 carrierInfoListWLAN

 Includes the list of WLAN carrier information for the measurement object.

 wlan-ToAddModList

 Includes the list of WLAN identifiers to be added to the measurement configuration.

 wlan-ToRemoveList

 Includes the list of WLAN identifiers to be removed from the measurement configuration.

MeasResults

The IE MeasResults covers measured results for intra-frequency, inter-frequency and inter- RAT mobility.

#### MeasResults information element

ASN1	START
------	-------

MeasResults ::= measId measResultPCell rsrpResult rsrqResult SEQUENCE { MeasId, SEQUENCE { RSRP-Range, RSRQ-Range

}, measResultListEUTRA CHOICE { measResultNeighCells MeasResultListEUTRA, measResultListUTRA MeasResultListUTRA, measResultListGERAN MeasResultListGERAN, measResultsCDMA2000 MeasResultsCDMA2000, measResultNeighCellListNR-r15 MeasResultCellListNR-r15 } OPTIONAL, [[ measResultForECID-r9 MeasResultForECID-r9 OPTIONAL ]], [[ locationInfo-r10 LocationInfo-r10 OPTIONAL, measResultServFreqList-r10 MeasResultServFreqList-r10 OPTIONAL 11, [[ measId-v1250 MeasId-v1250 OPTIONAL, RSRQ-Range-v1250 measResultPCell-v1250 OPTIONAL, measResultCSI-RS-List-r12 MeasResultCSI-RS-List-r12 OPTIONAL ]], [[ measResultForRSSI-r13 MeasResultForRSSI-r13 OPTIONAL, measResultServFreqListExt-r13 MeasResultServFreqListExt-r13 OPTIONAL, measResultSSTD-r13 MeasResultSSTD-r13 OPTIONAL, measResultPCell-v1310 SEQUENCE { rs-sinr-Result-r13 RS-SINR-Range-r13 OPTIONAL. 
 J
 UL-PDCP-DelayResultList-r13

 UL-PDCP-DelayResultList-r13
 UL-PDCP-DelayResultList-r13
 OPTIONAL, measResultListWLAN-r13 MeasResultListWLAN-r13 OPTIONAL ]], measResultPCell-v1360 RSRP-Range-v1360 OPTIONAL 11 ]], [[ measResultListCBR-r14 MeasResultListCBR-r14 OPTIONAL. measResultListWLAN-r14 MeasResultListWLAN-r14 OPTIONAL ]], [[ measResultServFreqListNR-r15 MeasResultCellListSFTD-r15 MeasResultCellListSFTD-r15 MeasResultCellListSFTD-r15 MeasResultServFreqListNR-r15 OPTIONAL, OPTIONAL 11, logMeasResultListWLAN-r15 LogMeasResultListW measResultSensing-r15 MeasResultSensing-r15 heightUE-r15 TWTFGTP for first LogMeasResultListBT-r15 [[ logMeasResultListBT-r15 OPTIONAL, LogMeasResultListWLAN-r15 OPTIONAL, OPTIONAL, OPTIONAL INTEGER (-400..8880) ]] } MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA MeasResultEUTRA ::= SEQUENCE { physCellId PhysCellId, cgi-Info SEQUENCE { cellGlobalId CellGlobalIdEUTRA, trackingAreaCode TrackingAreaCode, PLMN-IdentityList2 plmn-IdentityList OPTIONAL OPTIONAL, } measResult SEQUENCE { rsrpResult RSRP-Range OPTIONAL. rsrqResult RSRQ-Range OPTIONAL, [[ additionalSI-Info-r9 AdditionalSI-Info-r9 OPTIONAL 11, [[ primaryPLMN-Suitable-r12 ENUMERATED {true} OPTIONAL, measResult-v1250 RSRO-Range-v1250 OPTTONAL. ]], [[ rs-sinr-Result-r13 RS-SINR-Range-r13 OPTIONAL, cgi-Info-v1310 SEQUENCE { UENCE { FreqBandIndicator-r11 freqBandIndicator-r13 OPTIONAL. OPTIONAL, multiBandInfoList-r13 MultiBandInfoList-r11 ENUMERATED {true} freqBandIndicatorPriority-r13 OPTIONAL } OPTIONAL ]], [[ measResult-v1360 RSRP-Range-v1360 OPTIONAL ]], ]] cgi-Info-5GC-r15 SEQUENCE (SIZE (1..maxPLMN-r11)) OF CellAccessRelatedInfo-5GC-OPTIONAL r15 ]] } }

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...,

```
MeasResultListIdle-r15 ::= SEQUENCE (SIZE (1..maxIdleMeasCarriers-r15)) OF MeasResultIdle-r15
MeasResultIdle-r15 ::= SEQUENCE {
                                               SEQUENCE {
    measResultServingCell-r15
       rsrpResult-r15
                                       RSRP-Range,
       rsrqResult-r15
                                       RSRQ-Range-r13
    }.
    measResultNeighCells-r15 CHOICE {
       measResultIdleListEUTRA-r15 MeasResultIdleListEUTRA-r15,
        . . .
    }
                                                                       OPTIONAL,
}
MeasResultIdleListEUTRA-r15 ::= SEQUENCE (SIZE (1..maxCellMeasIdle-r15)) OF MeasResultIdleEUTRA-r15
MeasResultIdleEUTRA-r15 ::= SEQUENCE {
    carrierFreq-r15
                                       ARFCN-ValueEUTRA-r9,
    physCellId-r15
                                       PhysCellId,
                                       SEQUENCE {
    measResult-r15
                                          RSRP-Range,
       rsrpResult-r15
       rsrqResult-r15
                                           RSRQ-Range-r13
    },
    . . .
}
MeasResultServFreqListNR-r15 ::=
                                 SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasResultServFreqNR-r15
MeasResultServFreqNR-r15 ::=
carrierFreq-r15
                                  SEQUENCE {
                                       ARFCN-ValueNR-r15,
    measResultSCell-r15
                                       MeasResultCellNR-r15
                                                                           OPTIONAL,
    measResultBestNeighCell-r15
                                       MeasResultCellNR-r15
                                                                           OPTIONAL,
    . . .
}
MeasResultCellListNR-r15::=
                              SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCellNR-r15
                                   SEQUENCE {
MeasResultCellNR-r15 ::=
   pci-r15
                                       PhysCellIdNR-r15,
    measResultCell-r15
                                       MeasResultNR-r15,
    measResultRS-IndexList-r15
                                       MeasResultSSB-IndexList-r15
                                                                              OPTIONAL,
    [[ cgi-Info-r15
                                          CGI-InfoNR-r15
                                                                       OPTIONAL
    ]]
}
MeasResultNR-r15 ::=
                                   SEOUENCE {
                                   RSRP-RangeNR-r15
   rsrpResult-r15
                                                                               OPTIONAL,
    rsrqResult-r15
                                       RSRQ-RangeNR-r15
                                                                               OPTIONAL,
   rs-sinr-Result-r15
                                      RS-SINR-RangeNR-r15
                                                                               OPTIONAL,
}
MeasResultSSB-IndexList-r15::= SEQUENCE (SIZE (1..maxRS-IndexReport-r15)) OF MeasResultSSB-
Index-r15
MeasResultSSB-Index-r15 ::=
                              SEQUENCE {
                              RS-IndexNR-r15,
   ssb-Index-r15
    measResultSSB-Index-r15
                                       MeasResultNR-r15
                                                                           OPTIONAL,
    . . .
}
MeasResultServFreqList-r10 ::= SEQUENCE (SIZE (1..maxServCell-r10)) OF MeasResultServFreq-r10
MeasResultServFreqListExt-r13 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasResultServFreq-r13
                                   SEQUENCE {
MeasResultServFreq-r10 ::=
   servFreqId-r10
                                       ServCellIndex-r10,
                                       SEQUENCE {
    measResultSCell-r10
       rsrpResultSCell-r10
                                           RSRP-Range,
       rsrqResultSCell-r10
                                           RSRQ-Range
                                                               OPTIONAL,
                                       SEQUENCE {
    measResultBestNeighCell-r10
       physCellId-r10
                                          PhysCellId,
        rsrpResultNCell-r10
                                           RSRP-Range,
       rsrqResultNCell-r10
                                           RSRQ-Range
    }
                                                               OPTIONAL.
```

```
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```

```
[[ measResultSCell-v1250
                                          RSRQ-Range-v1250 OPTIONAL,
                                        RSRQ-Range-v1250
        measResultBestNeighCell-v1250
                                                              OPTIONAL
    11,
    [[ measResultSCell-v1310
                                          SEQUENCE {
          rs-sinr-Result-r13
                                              RS-SINR-Range-r13
        }
             OPTIONAL,
       measResultBestNeighCell-v1310 SEQUENCE {
          rs-sinr-Result-r13
                                              RS-SINR-Range-r13
        }
              OPTIONAL
    ]]
}
MeasResultServFreq-r13 ::=
                                 SEOUENCE {
    servFreqId-r13
                                      ServCellIndex-r13,
    measResultSCell-r13
                                       SEQUENCE {
                                        RSRP-Range,
      rsrpResultSCell-r13
       rsrqResultSCell-r13
                                          RSRQ-Range-r13,
       rs-sinr-Result-r13
                                          RS-SINR-Range-r13 OPTIONAL
    }
                                                              OPTIONAL.
    measResultBestNeighCell-r13
                                     SEQUENCE {
       physCellId-r13
                                          PhysCellId,
       rsrpResultNCell-r13
                                          RSRP-Range,
        rsrqResultNCell-r13
                                           RSRQ-Range-r13,
       rs-sinr-Result-r13
                                          RS-SINR-Range-r13 OPTIONAL
    }
                                                               OPTTONAL.
    [[ measResultBestNeighCell-v1360
rsrpResultNCell-v1360
                                          SEQUENCE {
                                              RSRP-Range-v1360
        }
                                                               OPTIONAL
    ]]
}
MeasResultCSI-RS-List-r12 ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCSI-RS-r12
MeasResultCSI-RS-r12 ::=
                               SEQUENCE {
   measCSI-RS-Id-r12
                                  MeasCSI-RS-Id-r12,
    csi-RSRP-Result-r12
                                   CSI-RSRP-Range-r12,
    . . .
}
MeasResultListUTRA ::=
                                  SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA
MeasResultUTRA ::= SEQUENCE {
   physCellId
                                       CHOICE {
       fdd
                                           PhysCellIdUTRA-FDD,
        tdd
                                           PhysCellIdUTRA-TDD
    },
    cgi-Info
                                       SEQUENCE {
        cellGlobalId
                                           CellGlobalIdUTRA,
                                           BIT STRING (SIZE (16))
       locationAreaCode
                                                                        OPTIONAL,
                                           BIT STRING (SIZE (8))
       routingAreaCode
                                                                          OPTIONAL,
       plmn-IdentityList
                                          PLMN-IdentityList2
                                                                          OPTIONAL
    }
                                                              OPTIONAL,
   measResult
                                       SEQUENCE {
       utra-RSCP
                                          INTEGER (-5..91)
                                                                          OPTIONAL,
       utra-EcN0
                                           INTEGER (0..49)
                                                                          OPTIONAL,
        [[ additionalSI-Info-r9
                                              AdditionalSI-Info-r9
                                                                                  OPTIONAL
        11,
        [[ primaryPLMN-Suitable-r12
                                             ENUMERATED {true}
                                                                          OPTTONAL.
        ]]
    }
}
                                  SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultGERAN
MeasResultListGERAN ::=
MeasResultGERAN ::= SEQUENCE {
   carrierFreq
                                       CarrierFreqGERAN,
    physCellId
                                       PhysCellIdGERAN,
    cgi-Info
                                       SEQUENCE {
       cellGlobalId
                                          CellGlobalIdGERAN,
                                           BIT STRING (SIZE (8))
       routingAreaCode
                                                                          OPTIONAL
    }
                                                                          OPTIONAL,
    measResult
                                       SEQUENCE {
       rssi
                                           INTEGER (0..63),
        . . .
    }
```

```
usResultsCDMA2000 ::=
preRegistrationStatusHRPD
measResultListCDMA2000
MeasResultsCDMA2000 ::=
                                   SEQUENCE {
                                  BOOLEAN,
                                       MeasResultListCDMA2000
}
MeasResultListCDMA2000 ::=
                           SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultCDMA2000
MeasResultCDMA2000 ::= SEQUENCE {
   physCellId
                                        PhysCellIdCDMA2000,
    cgi-Info
                                        CellGlobalIdCDMA2000
                                                                          OPTIONAL,
                                        SEQUENCE {
   measResult
       pilotPnPhase
                                           INTEGER (0..32767)
                                                                         OPTIONAL,
       pilotStrength
                                           INTEGER (0..63),
        . . .
    }
}
MeasResultListWLAN-r13 ::=
                              SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultWLAN-r13
                              SEQUENCE (SIZE (1..maxWLAN-Id-Report-r14)) OF MeasResultWLAN-r13
MeasResultListWLAN-r14 ::=
MeasResultWLAN-r13 ::= SEQUENCE {
   wlan-Identifiers-r13
                                           WLAN-Identifiers-r12,
    carrierInfoWLAN-r13
                                           WLAN-CarrierInfo-r13
                                                                   OPTIONAL.
                                           WLAN-BandIndicator-r13 OPTIONAL,
   bandWLAN-r13
   rssiWLAN-r13
                                           WLAN-RSSI-Range-r13,
    availableAdmissionCapacityWLAN-r13
                                           INTEGER (0..31250)
                                                                   OPTIONAL,
   backhaulDL-BandwidthWLAN-r13
                                           WLAN-backhaulRate-r12 OPTIONAL,
   backhaulUL-BandwidthWLAN-r13
                                         WLAN-backhaulRate-r12 OPTIONAL,
                                           INTEGER (0..255) OPTIONAL,
INTEGER (0..65535) OPTIONAL,
    channelUtilizationWLAN-r13
    stationCountWLAN-r13
                                           ENUMERATED {true} OPTIONAL,
   connectedWLAN-r13
}
MeasResultListCBR-r14 ::=
                                   SEQUENCE (SIZE (1..maxCBR-Report-r14)) OF MeasResultCBR-r14
MeasResultCBR-r14 ::= SEQUENCE {
   poolIdentity-r14 SL-V2X-TxPoolReportIdentity-r14,
    cbr-PSSCH-r14
                           SL-CBR-r14,
   cbr-PSCCH-r14
                           SL-CBR-r14
                                                   OPTIONAL
}
MeasResultSensing-r15 ::= SEQUENCE {
   sl-SubframeRef-r15 INTEGER (0..10239),
                               SEQUENCE (SIZE (0..400)) OF SensingResult-r15
    sensingResult-r15
}
SensingResult-r15 ::= SEQUENCE {
                        INTEGER (1..2000)
   resourceIndex-r15
}
MeasResultForECID-r9 ::= SEQUENCE {
ue-RxTxTimeDiffResult-r9
                                            INTEGER (0..4095),
   currentSFN-r9
                                           BIT STRING (SIZE (10))
}
PLMN-IdentityList2 ::=
                                   SEQUENCE (SIZE (1..5)) OF PLMN-Identity
AdditionalSI-Info-r9 ::=
csg-MemberStatus-r9
                                   SEQUENCE {
                                   ENUMERATED {member}
                                                                   OPTIONAL,
    csg-Identity-r9
                                       CSG-Identity
                                                                          OPTIONAL
}
MeasResultForRSSI-r13 ::= SEQUENCE {
   rssi-Result-r13
                                           RSSI-Range-r13,
                                            INTEGER (0..100),
    channelOccupancy-r13
    . . .
}
UL-PDCP-DelayResultList-r13 ::=
                                  SEQUENCE (SIZE (1..maxQCI-r13)) OF UL-PDCP-DelayResult-r13
UL-PDCP-DelayResult-r13 ::=
                                    SEQUENCE {
   qci-Id-r13
                                       ENUMERATED {qci1, qci2, qci3, qci4, spare4, spare3, spare2,
                                       spare1},
    excessDelav-r13
                                       INTEGER (0..31),
```

```
I-InfoNR-r15 ::= SEQUENCE {

plmn-IdentityInfoList-r15 PLMN-IdentityInfoListNR-r15 OPTIONAL,

frequencyBandList-15 MultiFrequencyBandListNR-r15 OPTIONAL,

noSIB1-r15 SEQUENCE {

ssb-SubcarrierOffset-r15 INTEGER (0..15),

pdcch-ConfigSIB1-r15 INTEGER (0..255)
CGI-InfoNR-r15 ::=
     }
                                                                                                                   OPTIONAL,
      . . .
}
CellIdentityNR-r15 ::=
                                                     BIT STRING (SIZE (36))
PLMN-IdentityListNR-r15 ::=
                                                     SEQUENCE (SIZE (1.. maxPLMN-NR-r15)) OF PLMN-Identity
PLMN-IdentityInfoListNR-r15 ::=
                                                     SEQUENCE (SIZE (1..maxPLMN-NR-r15)) OF PLMN-IdentityInfoNR-r15
PLMN-IdentityInfoNR-r15 ::=SEQUENCE {plmn-IdentityList-r15PLMN-IdentityListNR-r15,trackingAreaCode-r15TrackingAreaCodeNR-r15ran-AreaCode-r15RAN-AreaCode-r15cellIdentity-r15CellIdentityNR-r15
                                                                                                         OPTIONAL,
                                                                                                           OPTIONAL,
     cellIdentity-r15
                                                            CellIdentityNR-r15
}
TrackingAreaCodeNR-r15 ::=
                                                     BIT STRING (SIZE (24))
```

-- ASN1STOP

}

MeasResults field descriptions
availableAdmissionCapacityWLAN
Indicates the available admission capacity of WLAN as defined in IEEE 802.11-2012 [67].
backhauIDL-BandwidthWLAN Indicates the backhaul available downlink bandwidth of WLAN, equal to Downlink Speed times Downlink Load defined
in Wi-Fi Alliance Hotspot 2.0 [76].
backhaulUL-BandwidthWLAN
Indicates the backhaul available uplink bandwidth of WLAN, equal to Uplink Speed times Uplink Load defined in Wi-Fi
Alliance Hotspot 2.0 [76].
bandWLAN
Indicates the WLAN band.
<i>carrierFreq</i> Indicates the carrier frequency. Within <i>MeasResultIdleListEUTRA-r15</i> , UE only includes measurements with the same
carrier frequency.
carrierInfoWLAN
Indicates the WLAN channel information.
cbr-PSSCH
Indicates the CBR measurement results on the PSSCH of the pool indicated by poolIdentity. If adjacencyPSCCH-
PSSCH is set to TRUE for the pool indicated by <i>poolIdentity</i> , this field indicates the CBR measurement of both the
PSSCH and PSCCH resources which are measured together. cbr-PSCCH
Indicates the CBR measurement results on the PSCCH of the pool indicated by <i>pool/dentity</i> . This field is only included
if adjacencyPSCCH-PSSCH is set to FALSE for the pool indicated by pool/dentity.
channelOccupancy
Indicates the percentage of samples when the RSSI was above the configured channelOccupancyThreshold for the
associated reportConfig.
channelUtilizationWLAN
Indicates WLAN channel utilization as defined in IEEE 802.11-2012 [67].
connectedWLAN Indicates whether the UE is connected to the WLAN for which the measurement results are applicable.
csg-MemberStatus
Indicates whether or not the UE is a member of the CSG of the neighbour cell.
currentSFN
Indicates the current system frame number when receiving the UE Rx-Tx time difference measurement results from
lower layer.
excessDelay
Indicates excess queueing delay ratio in UL, according to excess delay ratio measurement report mapping table, as defined in TS 36.314 [71], Table 4.2.1.1.1-1.
heightUE
Indicates height of the UE in meters relative to the sea level. Value 0 corresponds to sea level (i.e., negative value
indicates depth of the UE below sea level). Value -400 corresponds to -400 m, value -399 corresponds to -399 m and
so on.
locationAreaCode
A fixed length code identifying the location area within a PLMN, as defined in TS 23.003 [27].
<i>measId</i> Identifies the measurement identity for which the reporting is being performed. If the <i>measId-v1250</i> is included, the
measide (i.e. without a suffix) is ignored by eNB.
measing (i.e. without a sum in ignored by end). measResult
Measured result of an E-UTRA cell;
Measured result of a UTRA cell;
Measured result of a GERAN cell or frequency;
Measured result of a CDMA2000 cell;
Measured result of a WLAN;
Measured result of UE Rx-Tx time difference;
Measured result of UE SFN, radio frame and subframe timing difference; or Measured result of RSSI and channel occupancy.
measured result of NSSF and channel occupancy.
Measured results of the CSI-RS resources in discovery signals measurement.
measResultListCDMA2000
List of measured results for the maximum number of reported best cells for a CDMA2000 measurement identity.
measResultListEUTRA
List of measured results for the maximum number of reported best cells for an E-UTRA measurement identity. For UE
supporting CE Mode B, when CE mode B is not restricted by upper layers, <i>measResult-v1360</i> is reported if the measured RSRP is less than -140 dBm.
measured RSRP is less than - 140 dbm. measResultListGERAN
List of measured results for the maximum number of reported best cells or frequencies for a GERAN measurement
identity.

MeasResults field descriptions	
measResultListSFTD	
List of measured SFTD results for the reported cells for a NR measurement identity.	
measResultListUTRA	
List of measured results for the maximum number of reported best cells for a UTRA measurement identity.	
measResultListWLAN	
List of measured results for the maximum number of reported best WLAN outside the WLAN mobility set and	
connected WLAN, if any, for a WLAN measurement identity.	
measResultPCell	
Measured result of the PCell. For BL UEs or UEs in CE, when operating in CE Mode B, measResultPCell-v1360	is
reported if the measured RSRP is less than -140 dBm.	
measResultsCDMA2000	
Contains the CDMA2000 HRPD pre-registration status and the list of CDMA2000 measurements.	
MeasResultServFreqList	
Measured results of the serving frequencies: the measurement result of each SCell, if any, and of the best	
neighbouring cell on each serving frequency. For UE supporting CE Mode B, when CE mode B is not restricted b	y
upper layers, measResultBestNeighCell-v1360 is reported if the measured RSRP is less than -140 dBm.	
measResultServingCell	
Measured results of the serving cell (i.e., PCell) from IDLE mode measurements.	
noSIB1	
Contains ssb-SubcarrierOffset and pdcch-ConfigSIB1 fields acquired by the UE from MIB of the cell for which rep	ort
CGI procedure was requested by the network in case SIB1 was not broadcast by the cell.	
pilotPnPhase	
Indicates the arrival time of a CDMA2000 pilot, measured relative to the UE's time reference in units of PN chips,	see
C.S0005 [25]. This information is used in either SRVCC handover or enhanced 1xRTT CS fallback procedure to	
CDMA2000 1xRTT.	
pilotStrength	
CDMA2000 Pilot Strength, the ratio of pilot power to total power in the signal bandwidth of a CDMA2000 Forward	
Channel. See C.S0005 [25] for CDMA2000 1xRTT and C.S0024 [26] for CDMA2000 HRPD.	
poolldentity	
The identity of the transmission resource pool which is corresponding to the poolReportId configured in a resource	e
pool for V2X sidelink communication.	
plmn-IdentityList	
The list of PLMN Identity read from broadcast information when the multiple PLMN Identities are broadcast.	
preRegistrationStatusHRPD	
Set to TRUE if the UE is currently pre-registered with CDMA2000 HRPD. Otherwise set to FALSE. This can be	
impored by the oNR for CDMA 2000 1/DTT	

ignored by the eNB for CDMA2000 1xRTT.

MeasResults field descriptions	
qci-ld	
ndicates QCI value for which excessDelay is provided, according to TS 36.314 [71].	
resourceIndex	
ndicates the available resource candidates within the [T1, T2] window as specified in TS 36.213 [23]. clause 14.7 Value 1 indicates the resource candidate on the subframe indicated by <i>sl-SubframeRef</i> , from subchannel 0 to <i>sensingSubchannelNumber</i> -1. Value 2 indicates the resource candidate on the first subframe following the subfra ndicated by <i>sl-SubframeRef</i> , from subchannel 0 to <i>sensingSubchannelNumber</i> -1 (Value 101 indicates the resource candidate on the subframe indicated by <i>sl-SubframeRef</i> , from subchannel 1 to <i>sensingSubchannelNumber</i> , if the <i>numSubchannel</i> of the resource pool is larger than <i>sensingSubchannelNumber</i> ) and so on.	ame rce
routingAreaCode	
The RAC identity read from broadcast information, as defined in TS 23.003 [27].	
rsrpResult	
Measured RSRP result of an E-UTRA cell.	
The rsrpResult is only reported if configured by the eNB.	
rsrqResult	
Measured RSRQ result of an E-UTRA cell.	
The rsrqResult is only reported if configured by the eNB.	
	. ,
GERAN Carrier RSSI. RXLEV is mapped to a value between 0 and 63, TS 45.008 [28]. When mapping the RXLE	V
value to the RSSI bit string, the first/leftmost bit of the bit string contains the most significant bit.	
rssi-Result	
Measured RSSI result in dBm.	
rs-sinr-Result	
Measured RS-SINR result of an E-UTRA or NR cell. The <i>rs-sinr-Result</i> is only reported if configured by the eNB.	
<i>rssiWLAN</i> Measured WLAN RSSI result in dBm.	
sl-SubframeRef	
ndicates the subframe corresponding to n+T1 used to obtain the sensing measurement results (see TS 36.213 [2 Specifically, the value indicates the timing offset with respect to subframe#0 of DFN#0 in milliseconds.	23]).
stationCountWLAN	
ndicates the total number stations currently associated with this WLAN as defined in IEEE 802.11-2012 [67].	
ue-RxTxTimeDiffResult	
JE Rx-Tx time difference measurement result of the PCell, provided by lower layers. If <i>ue-</i> RxTxTimeDiffPeriodicaITDD-r13 is set to TRUE, the measurement mapping is according to EUTRAN TDD UE Ry ime difference report mapping in TS 36.133 [16] and measurement result includes NTAoffset, else the measuremer mapping is according to EUTRAN FDD UE Rx-Tx time difference report mapping in TS 36.133 [16].	
utra-EcN0	
According to CPICH_Ec/No in TS 25.133 [29] for FDD. Fourteen spare values. The field is not present for TDD.	
utra-RSCP	
According to CPICH_RSCP in TS 25.133 [29] for FDD and P-CCPCH_RSCP in TS 25.123 [30] for TDD. Thirty-or	ne
spare values.	
wlan-Identifiers	
ndicates the WLAN parameters used for identification of the WLAN for which the measurement results are applic	able

### MeasResultCellSFTD

_

-- ASN1START

The IE *MeasResultCellSFTD* consists of SFN and radio frame boundary difference between the PCell and an NR cell as specified in TS 38.215 [89] and TS 38.133 [84].

### MeasResultCellSFTD information element

```
MeasResultCellListSFTD-r15 ::= SEQUENCE (SIZE (1..maxCellSFTD)) OF MeasResultCellSFTD-r15
MeasResultCellSFTD-r15 ::= SEQUENCE {
    physCellId-r15 PhysCellIdNR-r15,
    sfn-OffsetResult-r15 INTEGER (0..1023),
    frameBoundaryOffsetResult-r15 INTEGER (-30720..30719),
    rsrpResult-r15 RSRP-RangeNR-r15 OPTIONAL
}
-- ASN1STOP
```

MeasResultCellSTD field descriptions
physCellId
Indicates the physical layer identity (PCI) of an NR cell.
sfn-OffsetResult
Indicates the SFN difference between the PCell and the NR cell as an integer value according to TS 38.215 [89].
frameBoundaryOffsetResult
Indicates the frame boundary difference between the PCell and the NR cell as an integer value according to TS
38.215 [89].
rsrpResult
Measured RSRP result of an NR cell.

### MeasResultSCG-FailureMRDC

The IE *MeasResultSCG-FailureMRDC* is used to provide measurement information concerning E-UTRA measurements upon SCG failure detected by a UE configured with NE-DC.

#### MeasResultSCG-FailureMRDC information element

```
-- ASN1START
MeasResultSCG-FailureMRDC-r15 ::= SEQUENCE {
    measResultFreqListEUTRA-r15
                                     MeasResultList3EUTRA-r15,
    . . .
}
MeasResultList3EUTRA-r15 ::=
                                     SEQUENCE (SIZE (1..maxFreq)) OF MeasResult3EUTRA-r15
MeasResult3EUTRA-r15 ::=
                                     SEQUENCE {
                                         ARFCN-ValueEUTRA-r9,
    carrierFreq-r15
   measResultServingCell-r15
measResultNeighCellList-r15
                                          MeasResultEUTRA
                                                                           OPTIONAL,
                                     MeasResultListEUTRA
                                                                       OPTIONAL,
    . . .
}
```

-- ASN1STOP

### MeasResultSSTD

The IE *MeasResultSSTD* consists of SFN, radio frame and subframe boundary difference between the PCell and the PSCell as specified in TS 36.214 [48] and TS 36.133 [16].

#### MeasResultSSTD information element

```
-- ASN1START

MeasResultSSTD-r13 ::= SEQUENCE {

sfn-OffsetResult-r13 INTEGER (0..1023),

frameBoundaryOffsetResult-r13 INTEGER (-5..4),

subframeBoundaryOffsetResult-r13 INTEGER (0..127)

}

-- ASN1STOP
```

#### MeasResultSSTD field descriptions

sfn-OffsetResult
Indicates the SFN difference between the PCell and the PSCell as an integer value according to TS 36.214 [48].
frameBoundaryOffsetResult
Indicates the frame boundary difference between the PCell and the PSCell as an integer value according to TS 36.214
[48].
subframeBoundaryOffsetResult
Indicates the subframe boundary difference between the PCell and the PSCell as an integer value according to the
mapping table in TS 36.133 [16].

MeasScaleFactor

The IE MeasScaleFactor specifies the factor for scaling the measurement performance requirements in TS 36.133 [16].

	MeasScaleFactor information element
ASN1START	
MeasScaleFactor-r12 ::=	ENUMERATED {sf-EUTRA-cf1, sf-EUTRA-cf2}
ASN1STOP	

NOTE: If the *reducedMeasPerformance* is not included in any *measObjectEUTRA* or *measObjectUTRA* and the *measScaleFactor* is included in the *measConfig*, E-UTRAN can configure any of the values for the *measScaleFactor* as specified in TS 36.133 [16].

#### MeasSensing-Config

The IE MeasSensing-Config specifies the input factors for sensing measurement as specified in TS 36.213 [23].

MeasSensing-Config information element

```
-- ASN1START

MeasSensing-Config-r15 ::= SEQUENCE {

sensingSubchannelNumber-r15 INTEGER (1..20),

sensingPeriodicity-r15 ENUMERATED {ms20, ms50, ms100, ms200,

ms300, ms400, ms500, ms600,

ms700, ms800, ms900, ms1000},

sensingReselectionCounter-r15 INTEGER (5..75),

sensingPriority-r15 INTEGER (1..8)

}
```

-- ASN1STOP

#### MeasSensing-Config field descriptions

### MTC-SSB-NR

The IE *MTC-SSB-NR* specifies the measurement timing configuration (MTC) applicable for SSB based NR measurements i.e. the time occasions for performing these measurements, see 5.5.2.13.

### MTC-SSB-NR information elements

```
-- ASN1START
```

MTC-SSB-NR-r15 ::= SEQUENCE {
 periodicityAndOffset-r15
 sf5-r15
 sf10-r15
 sf20-r15
 sf40-r15

CHOICE { INTEGER (0..4), INTEGER (0..9), INTEGER (0..19), INTEGER (0..39),

```
    sf80-r15
    INTEGER (0..79),

    sf160-r15
    INTEGER (0..159)

    },
    ssb-Duration-r15
    ENUMERATED {sf1, sf2, sf3, sf4, sf5 }

    }
```

-- ASN1STOP

_

# QuantityConfig

The IE *QuantityConfig* specifies the measurement quantities and layer 3 filtering coefficients for E-UTRA and inter-RAT measurements.

### QuantityConfig information element

ASN1START		
QuantityConfig ::= quantityConfigEUTRA quantityConfigUTRA quantityConfigGERAN quantityConfigCDMA2000	SEQUENCE { QuantityConfigEUTRA QuantityConfigUTRA QuantityConfigGERAN QuantityConfigCDMA2000	OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON OPTIONAL, Need ON
[[ quantityConfigUTRA-v1020	QuantityConfigUTRA-v1020	OPTIONAL Need ON
]], [[ quantityConfigEUTRA-v1250 ]],	QuantityConfigEUTRA-v1250	OPTIONAL Need ON
[[ quantityConfigEUTRA-v1310 quantityConfigWLAN-r13 ]],	QuantityConfigEUTRA-v1310 QuantityConfigWLAN-r13	OPTIONAL, Need ON OPTIONAL Need ON
<pre>[[ quantityConfigNRList-r15 ]] }</pre>	QuantityConfigNRList-r15	OPTIONAL Need ON
<pre>QuantityConfigEUTRA ::=    filterCoefficientRSRP    filterCoefficientRSRQ }</pre>	SEQUENCE { FilterCoefficient FilterCoefficient	DEFAULT fc4, DEFAULT fc4
<pre>QuantityConfigEUTRA-v1250 ::=    filterCoefficientCSI-RSRP-r12 OR }</pre>	SEQUENCE { FilterCoefficient	OPTIONAL Need
QuantityConfigEUTRA-v1310 ::= filterCoefficientRS-SINR-r13 }	SEQUENCE { FilterCoefficient	DEFAULT fc4
<pre>QuantityConfigUTRA ::=     measQuantityUTRA-FDD     measQuantityUTRA-TDD     filterCoefficient }</pre>	<pre>SEQUENCE {     ENUMERATED {cpich-RSCP, cpich-EcN0}     ENUMERATED {pccpch-RSCP},     FilterCoefficient</pre>	DEFAULT fc4
<pre>QuantityConfigUTRA-v1020 ::=    filterCoefficient2-FDD-r10 }</pre>	SEQUENCE { FilterCoefficient	DEFAULT fc4
<pre>QuantityConfigGERAN ::= measQuantityGERAN filterCoefficient }</pre>	SEQUENCE { ENUMERATED {rssi}, FilterCoefficient	DEFAULT fc2
QuantityConfigCDMA2000 ::= measQuantityCDMA2000 }	SEQUENCE { ENUMERATED {pilotStrength, pilotPnF	PhaseAndPilotStrength}
QuantityConfigNRList-r15 ::=	SEQUENCE (SIZE (1maxQuantSetsNR-r15))	OF QuantityConfigNR-r15
<pre>QuantityConfigNR-r15 ::=     measQuantityCellNR-r15     measQuantityRS-IndexNR-r15 }</pre>	SEQUENCE { QuantityConfigRS-NR-r15, QuantityConfigRS-NR-r15	OPTIONAL
QuantityConfigRS-NR-r15 ::=	SEQUENCE {	

<pre>filterCoeff-RSRP-r15 filterCoeff-RSRQ-r15 filterCoefficient-SINR-r13 }</pre>	FilterCoefficient FilterCoefficient FilterCoefficient	DEFAULT fc4, DEFAULT fc4, DEFAULT fc4
<pre>QuantityConfigWLAN-r13 ::= measQuantityWLAN-r13 filterCoefficient-r13 }</pre>	SEQUENCE { ENUMERATED {rssiWLAN}, FilterCoefficient	DEFAULT fc4
ASN1STOP		

	QuantityConfig field descriptions
filterCoefficient2-FDD	
	the UTRAN FDD measurement quantity, which is not included in
measQuantityUTRA-FDD, when reportQ	uantityUTRA-FDD is present in ReportConfigInterRAT.
filterCoefficientCSI-RSRP	
Specifies the filtering coefficient used for	CSI-RSRP.
filterCoefficientRSRP	
Specifies the filtering coefficient used for	RSRP.
filterCoefficientRSRQ	
Specifies the filtering coefficient used for	RSRQ.
filterCoefficientRS-SINR	
Specifies the filtering coefficient used for	RS-SINR.
measQuantityCDMA2000	
	000 measurements. <i>pilotPnPhaseAndPilotStrength</i> is only applicable for
MeasObjectCDMA2000 of cdma2000-Ty	
measQuantityRS-IndexNR	
	surement results of an NR RS index for a particular RS Type (e.g. SS/PBCH
	nt quantities (e.g. RSRP, RSRQ and SINR).
measQuantityGERAN	
Measurement quantity used for GERAN	measurements.
measQuantityCellINR	
	surement results of an NR cell for a particular RS Type (e.g. SS/PBCH block
and the configurable measurement quan	
measQuantityUTRA	
Measurement quantity used for UTRA m	easurements.
measQuantityWLAN	
Measurement quantity used for WLAN m	neasurements.
quantityConfigCDMA2000	
Specifies quantity configurations for CDM	A2000 measurements.
quantityConfigEUTRA	
Specifies filter configurations for E-UTRA	A measurements.
quantityConfigGERAN	
Specifies quantity and filter configuration	s for GERAN measurements.
quantityConfigUTRA	
	s for UTRA measurements. Field <i>quantityConfigUTRA-v1020</i> is applicable
only when <i>reportQuantityUTRA-FDD</i> is c	
quantityConfigWLAN	
Specifies quantity and filter configuration	s for WLAN measurements.

# ReportConfigEUTRA

The IE *ReportConfigEUTRA* specifies criteria for triggering of an E-UTRA measurement reporting event. The E-UTRA measurement reporting events concerning CRS are labelled AN with N equal to 1, 2 and so on.

Event A1: Serving becomes better than absolute threshold;

- Event A2: Serving becomes worse than absolute threshold;
- Event A3: Neighbour becomes amount of offset better than PCell/ PSCell;
- Event A4: Neighbour becomes better than absolute threshold;
- Event A5: PCell/ PSCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute threshold2;
- Event A6: Neighbour becomes amount of offset better than SCell.

The E-UTRA measurement reporting events concerning CSI-RS are labelled CN with N equal to 1 and 2.

Event C1: CSI-RS resource becomes better than absolute threshold;

Event C2: CSI-RS resource becomes amount of offset better than reference CSI-RS resource.

The E-UTRA measurement reporting events concerning CBR are labelled VN with N equal to 1 and 2.

- Event V1: CBR becomes larger than absolute threshold;
- Event V2: CBR becomes smaller than absolute threshold.

The E-UTRA reporting events concerning Aerial UE height are labelled HN with N equal to 1 and 2.

Event H1: Aerial UE height becomes higher than absolute threshold;

Event H2: Aerial UE height becomes lower than absolute threshold.

### ReportConfigEUTRA information element

```
-- ASN1START
```

```
ReportConfigEUTRA ::=
                                    SEOUENCE {
    triggerType
                                         CHOICE {
                                             SEQUENCE {
        event
            eventId
                                                 CHOICE {
                                                     SEQUENCE {
                eventA1
                   al-Threshold
                                                         ThresholdEUTRA
                },
                eventA2
                                                     SEQUENCE {
                    a2-Threshold
                                                         ThresholdEUTRA
                },
                                                     SEQUENCE {
                eventA3
                    a3-Offset
                                                         INTEGER (-30..30),
                    reportOnLeave
                                                         BOOLEAN
                },
                eventA4
                                                     SEQUENCE {
                    a4-Threshold
                                                         ThresholdEUTRA
                },
                eventA5
                                                     SEQUENCE {
                                                         ThresholdEUTRA,
                    a5-Threshold1
                    a5-Threshold2
                                                         ThresholdEUTRA
                },
                . . . .
                eventA6-r10
                                                     SEQUENCE {
                                                         INTEGER (-30..30),
                    a6-Offset-r10
                    a6-ReportOnLeave-r10
                                                        BOOLEAN
                },
                eventC1-r12
                                                     SEQUENCE {
                    cl-Threshold-r12
                                                         ThresholdEUTRA-v1250,
                    cl-ReportOnLeave-r12
                                                         BOOLEAN
                },
                eventC2-r12
                                                     SEQUENCE {
                    c2-RefCSI-RS-r12
                                                         MeasCSI-RS-Id-r12,
                    c2-Offset-r12
                                                         INTEGER (-30..30),
                                                         BOOLEAN
                    c2-ReportOnLeave-r12
                },
                eventV1-r14
                                                     SEQUENCE {
                    v1-Threshold-r14
                                                         SL-CBR-r14
                },
                eventV2-r14
                                                     SEQUENCE {
```

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v2-Threshold-r14 SL-CBR-r14 }, ntH1-r15 SEQUENCE { h1-ThresholdOffset-r15 INTEGER (0..300), h1-Westorogia_15 INTEGER (1.1 eventH1-r15 h1-Hysteresis-15 INTEGER (1..16) }, SEQUENCE { eventH2-r15 INTEGER (0..300), h2-ThresholdOffset-r15 h2-Hysteresis-15 INTEGER (1..16) } }, Hysteresis, hysteresis timeToTrigger TimeToTrigger }, periodical SEOUENCE { ENUMERATED { purpose reportStrongestCells, reportCGI} } }, triggerQuantity ENUMERATED {rsrp, rsrq}, ENUMERATED {sameAsTriggerQuantity, both}, reportQuantity maxReportCells INTEGER (1..maxCellReport), reportInterval ReportInterval, reportAmount ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity}, si-RequestForHO-r9 ENUMERATED {setup} OPTIONAL, -- Cond rep ue-RxTxTimeDiffPeriodical-r9 ENUMERATED {setup} OPTIONAL -- Need OR [[ si-RequestForHO-r9 OPTIONAL, -- Cond reportCGI 11, [[ includeLocationInfo-r10 ENUMERATED {true} OPTIONAL, -- Need OR ENUMERATED {setup} OPTIONAL -- Need OR ENUMERATED {true} reportAddNeighMeas-r10 11. [[ alternativeTimeToTrigger-r12 CHOICE { NULL, release BOOLEAN OPTIONAL, -- Need ON BOOLEAN OPTIONAL, -- Need ON BOOLEAN OPTION setup } BOOLEAN OPTIONAL, -- Need ON BOOLEAN OPTIONAL, -- Need ON RSRQ-RangeConfig-r12 OPTIONAL, -- Need ON RSRQ-RangeConfig-r12 OPTIONAL, -- Need ON useT312-r12 usePSCell-r12 aN-Threshold1-v1250 a5-Threshold2-v1250 a5-Threshold2-v1250KSKQ-RangeConfig-f12Official,reportStrongestCSI-RSs-r12BOOLEANOPTIONAL,-- Need ONreportCRS-Meas-r12BOOLEANOPTIONAL,-- Need ONtriggerQuantityCSI-RS-r12BOOLEANOPTIONAL-- Need -- Need ON ]], BOOLEAN OPTIONAL, -- Need ON [[ reportSSTD-Meas-r13 rs-sinr-Config-r13 CHOICE { release NULL, triggerQuantity-v1310 aN-Threshold1-r13 a5-Threshold2-r13 SEQUENCE { setup SEQUENCE { ENUMERATED {sinr} OPTIONAL, -- Need ON RS-SINR-Range-r13 OPTIONAL, -- Need ON RS-SINR-Range-r13 OPTIONAL, -- Need ON reportQuantity-v1310 ENUMERATED {rsrpANDsinr, rsrqANDsinr, all} } } OPTIONAL, -- Need ON useWhiteCellList-r13 BOOLEAN OPTIONAL, measRSSI-ReportConfig-r13 MeasRSSI-ReportConfig-r13 OPTIONAL, includeMultiBandInfo-r13 ENIMERATED [true] OPTIONAL, -- Need ON -- Need ON -- Cond reportCGI ul-DelayConfig-r13 UL-DelayConfig-r13 OPTIONAL -- Need ON 11, [[ ue-RxTxTimeDiffPeriodicalTDD-r13 BOOLEAN OPTIONAL -- Need ON ]], ]] ENUMERATED {reportLocation, sidelink, spare2, spare1} purpose-v1430 OPTIONAL -- Need ON ]], [[ maxReportRS-Index-r15 INTEGER (0..maxRS-IndexReport-r15) OPTIONAL -- Need ON BT-NameListConfig-r15 OPTIONAL, -- Need ON WLAN-NameListConfig-r15 OPTIONAL, -- Need 1], includeBT-Meas-r15 BT includeWLAN-Meas-r15 [[ includeBT-Meas-r15 ON ENUMERATED {sensing} -- Need ON purpose-r15 OPTIONAL, numberOfTriggeringCells-r15 INTEGER (2..maxCellReport) OPTIONAL, -- Cond a3a4a5 BOOLEAN -- Cond a4a5 a4-a5-ReportOnLeave-r15 OPTIONAL ]] }

RSRQ-RangeConfig-r12 ::= CHOICE {

**ETSI** 

release	NU	LL,		
setup	RS	RO-Range-v1250		
1	110	ng nange viller		
J				
		(		
ThresholdEUTRA :	::= CHOICE	{		
threshold-RS	SRP RS	RP-Range,		
threshold-RS	SRO RS	RO-Range		
1		<u>e</u> j-		
J				
	1050	<b>DD D</b> 10		
ThresholdEUTRA-v	/1250 ::= CS1-RS	RP-Range-r12		
MeasRSSI-Report(	Config-r13 ::= SEQUENCE {			
channel Occur	pancyThreshold-r13	RSSI-Range-r13	OPTIONAL	Need OR
1		nobi nange 115	01 110101	need on
1				
ASN1STOP				

	ReportConfigEUTRA field descriptions
a3-Offset/ a6-Offset/ c2-Offse	t
Offset value to be used in EUT	RA measurement report triggering condition for event a3/ a6/ c2. The actual value is
field value * 0.5 dB.	1 00 0
alternativeTimeToTrigger	
	licable for cells specified in altTTT-CellsToAddModList of the associated measuremen
object, if configured	
	JNA
aN-ThresholdM/ cN-Threshol	
	A measurement report triggering condition for event number aN/ cN. If multiple
	t number aN/ cN, the thresholds are differentiated by M. E-UTRAN configures aN-
Threshold1 only for events A1,	A2, A4, A5 and a5-Threshold2 only for event A5.
c1-ReportOnLeave/ c2-Repor	
	shall initiate the measurement reporting procedure when the leaving condition is met
	S-TriggeredList, as specified in 5.5.4.1.
c2-RefCSI-RS	
	from the measCSI-RS-ToAddModList of the associated measObject, to be used as
	in EUTRA measurement report triggering condition for event c2.
channelOccupancyThreshold	1
RSSI threshold which is used for	or channel occupancy evaluation.
eventld	
	red reporting criteria. EUTRAN may set this field to eventC1 or eventC2 only if
	the associated measObject with one or more CSI-RS resources. The eventC1 and
	he eventId if RS-SINR is configured as triggerQuantity or reportQuantity.
h1-Hysteresis, h2-Hysteresis	
This parameter is used within the	ne entry and leave condition of an event triggered reporting condition for event H1 and
	eld value. If this field is configured UE shall ignore parameter hysteresis.
h1-ThresholdOffset, h2-Thres	
	<i>Ref</i> to obtain the threshold to be used in EUTRA height report triggering condition for
	lue for h1-ThresholdOffset and h2-ThresholdOffset is expressed in meters such that
	corresponds to offset value 0m, value 1 corresponds to offset value 2m, value 2
correspond to offset value 4m, a	and so on.
includeMultiBandInfo	
If this field is present, the UE sh	nall acquire and include multi band information in the measurement report.
maxReportCells	
	the serving cell, to include in the measurement report concerning CRS, and max
	include in the measurement report concerning CSI-RS.
measRSSI-ReportConfig	
If this field is present, the UE sh	nall perform measurement reporting for RSSI and channel occupancy and ignore the
triggerQuantity, reportQuantity	and maxReportCells fields. E-UTRAN only sets this field to true when setting
triggerType to periodical and pu	
numberOfTriggeringCells	
	etected that are required to fulfill an event for a measurement report to be triggered.
	nts concerning neighbor cells, i.e. eventA3, eventA4, eventA5.
reportAmount	
	ts applicable for triggerType event as well as for triggerType periodical. In case
purpose is set to reportCGI or r	eportSSTD-Meas is set to true, only value 1 applies.
reportCRS-Meas	
	rsrp, rsrq together with csi-rsrp in the measurement report, if possible.
	Leave/ a4-a5-ReportOnLeave
	shall initiate the measurement reporting procedure when the leaving condition is met
for a cell in <i>cellsTriggeredList</i> , a	as specified in 5.5.4.1.
reportQuantity	
	the measurement report. The value both means that both the rsrp and rsrg quantities
	irement report. The value <i>rsrpANDsinr</i> and <i>rsrqANDsinr</i> mean that both <i>rsrp</i> and <i>rs-sin</i>
	<i>-sinr</i> quantities are to be included respectively in the measurement report. The value a
	r are to be included in the measurement report. In case triggerQuantityCSI-RS is
	iggerQuantity applies. If reportQuantity-v1310 is configured, the UE only considers this
extension (and ignores reportQ	uantity i.e. without suffix).
reportSSTD-Meas	
	shall measure SSTD between the PCell and the PSCell as specified in TS 36.214 [48
	reportQuantity and maxReportCells fields. E-UTRAN only sets this field to true when
	l and purpose to reportStrongestCells.
reportStrongestCSI-RSs	
	S measurement report is performed. EUTRAN configures value <i>TRUE</i> only if <i>measDS</i> octated <i>measObject</i> with one or more CSI-RS resources.

ReportConfigEUTRA field descriptions	
si-RequestForHO	
The field applies to the <i>reportCGI</i> functionality, and when the field is included, the UE is allowed to use autonom gaps in acquiring system information from the neighbour cell, applies a different value for T321, and includes diffields in the measurement report.	
ThresholdEUTRA	
For RSRP: RSRP based threshold for event evaluation. The actual value is field value – 140 dBm.	
For RSRQ: RSRQ based threshold for event evaluation. The actual value is (field value – 40)/2 dB.	
For RS-SINR: RS-SINR based threshold for event evaluation. The actual value is (field value -46)/2 dB.	
For CSI-RSRP: CSI-RSRP based threshold for event evaluation. The actual value is field value – 140 dBm.	
EUTRAN configures the same threshold quantity for all the thresholds of an event.	
timeToTrigger	
Fime during which specific criteria for the event needs to be met in order to trigger a measurement report.	
triggerQuantity	
The quantity used to evaluate the triggering condition for the event concerning CRS. EUTRAN sets the value	
according to the quantity of the ThresholdEUTRA for this event. The values rsrp, rsrq and sinr correspond to	
Reference Signal Received Power (RSRP), Reference Signal Received Quality (RSRQ) and Reference Signal S	
o Noise and Interference Ratio (RS-SINR), see TS 36.214 [48]. If triggerQuantity-v1310 is configured, the UE or	nly
considers this extension (and ignores <i>triggerQuantity</i> i.e. without suffix).	
triggerQuantityCSI-RS	
The quantity used to evaluate the triggering condition for the event concerning CSI-RS. The value TRUE correspondence of the triggering condition for the event concerning CSI-RS.	
o CSI Reference Signal Received Power (CSI-RSRP), see TS 36.214 [48]. E-UTRAN configures value TRUE if	and
only if the measurement reporting event concerns CSI-RS.	
ue-RxTxTimeDiffPeriodical	40
f this field is present, the UE shall perform UE Rx-Tx time difference measurement reporting and ignore the field	JS
triggerQuantity, reportQuantity and maxReportCells. If the field is present, the only applicable values for the corresponding triggerType and purpose are periodical and reportStrongestCells respectively.	
ue-RxTxTimeDiffPeriodicalTDD	
f this field is set to TRUE, the UE shall perform UE Rx-Tx time difference measurement reporting according to	
EUTRAN TDD UE Rx-Tx time difference report mapping in TS 36.133 [16]. If the field is configured, the <i>ue</i> -	
RxTxTimeDiffPeriodical shall be configured. The field is applicable for TDD only.	
usePSCell	
f this field is set to TRUE the UE shall use the PSCell instead of the PCell. E-UTRAN configures value TRUE or	nlv for
events A3 and A5, see 5.5.4.4 and 5.5.4.6.	ily ioi
useT312	
f value TRUE is configured, the UE shall use the timer T312 with the value t312 as specified in the correspondir	na
measObject. If the corresponding measObject does not include the timer T312 then the timer T312 is considered	
not configured. E-UTRAN configures value TRUE only if triggerType is set to event.	
useWhiteCellList	
ndicates whether only the cells included in the white-list of the associated measObject are applicable as specific	əd in
5.5.4.1. E-UTRAN does not configure the field for events A1, A2, C1 and C2.	
ul-DelayConfig	
f the field is present, E-UTRAN configures UL PDCP Packet Delay per QCI measurement and the UE shall igno	
ields triggerQuantity and maxReportCells. The applicable values for the corresponding triggerType and reportIn	
are periodical and (one of the) ms1024, ms2048, ms5120 or ms10240 respectively. The reportInterval indicates t	
periodicity for performing and reporting of UL PDCP Delay per QCI measurement as specified in TS 36.314 [71]	•

Conditional presence	Explanation
reportCGI	The field is optional, need OR, in case <i>purpose</i> is included and set to <i>reportCGI</i> ;
	otherwise the field is not present and the UE shall delete any existing value for this field.
a3a4a5	This field is optional, need OR, in case eventId is set to eventA3 or eventA4 or eventA5;
	otherwise, this field is not present and the UE shall delete any existing value of this field.
a4a5	This field is optional, need OR, in case eventId is set to eventA4 or eventA5; otherwise,
	this field is not present and the UE shall delete any existing value of this field.

# – ReportConfigId

The IE ReportConfigId is used to identify a measurement reporting configuration.

# ReportConfigId information element

ASN1START	
ReportConfigId ::=	INTEGER (1maxReportConfigId)

-- ASN1STOP

### - ReportConfigInterRAT

The IE *ReportConfigInterRAT* specifies criteria for triggering of an inter-RAT measurement reporting event. The inter-RAT measurement reporting events for NR, UTRAN, GERAN and CDMA2000 are labelled BN with N equal to 1, 2 and so on. The inter-RAT measurement reporting events for WLAN are labelled WN with N equal to 1, 2 and so on.

- Event B1: Neighbour becomes better than absolute threshold;
- Event B2: PCell becomes worse than absolute threshold1 AND Neighbour becomes better than another absolute threshold2.
- Event W1: WLAN becomes better than a threshold;
- Event W2: All WLAN inside WLAN mobility set become worse than a threshold1 and a WLAN outside WLAN mobility set becomes better than a threshold2;
- Event W3: All WLAN inside WLAN mobility set become worse than a threshold.

The b1 and b2 event thresholds for CDMA2000 are the CDMA2000 pilot detection thresholds are expressed as an unsigned binary number equal to  $[-2 \times 10 \log 10 \text{ E}_c/\text{I}_0]$  in units of 0.5dB, see C.S0005 [25] for details.

### ReportConfigInterRAT information element

```
-- ASN1START
ReportConfigInterRAT ::=
                                    SEQUENCE {
                                       CHOICE {
    triggerType
        event
                                          SEQUENCE {
            eventId
                                              CHOICE {
                                                  SEQUENCE {
               eventB1
                   bl-Threshold
                                                       CHOICE {
                        b1-ThresholdUTRA
                                                            ThresholdUTRA,
                        b1-ThresholdGERAN
                                                            ThresholdGERAN
                        b1-ThresholdCDMA2000
                                                            ThresholdCDMA2000
                    }
                },
                eventB2
                                                   SEQUENCE {
                   b2-Threshold1
                                                    ThresholdEUTRA,
                                                       CHOICE {
                   b2-Threshold2
                        b2-Threshold2UTRA
                                                           ThresholdUTRA.
                        b2-Threshold2GERAN
                                                            ThresholdGERAN
                        b2-Threshold2CDMA2000
                                                            ThresholdCDMA2000
                    }
                },
                eventW1-r13
                                               SEQUENCE {
                    wl-Threshold-r13
                                                WLAN-RSSI-Range-r13
                },
                eventW2-r13
                                                SEQUENCE {
                   w2-Threshold1-r13
                                                WLAN-RSSI-Range-r13,
                    w2-Threshold2-r13
                                                WLAN-RSSI-Range-r13
                },
                                               SEOUENCE {
                eventW3-r13
                   w3-Threshold-r13
                                                WLAN-RSSI-Range-r13
                },
                eventB1-NR-r15
                                                        SEOUENCE {
                   b1-ThresholdNR-r15
                                                        ThresholdNR-r15,
                                                        BOOLEAN
                    reportOnLeave-r15
                },
                eventB2-NR-r15
                                                        SEQUENCE {
                   b2-Threshold1-r15
                                                       ThresholdEUTRA,
                   b2-Threshold2NR-r15
                                                        ThresholdNR-r15,
                    reportOnLeave-r15
                                                        BOOLEAN
                }
            },
            hysteresis
                                            Hysteresis,
                                            TimeToTrigger
            timeToTrigger
        },
        periodical
                                                SEQUENCE {
                                                    ENUMERATED {
            purpose
```

reportStrongestCells, reportStrongestCellsForSON, reportCGI } } }, maxReportCells INTEGER (1..maxCellReport), ReportInterval, reportInterval ENUMERATED {r1, r2, r4, r8, r16, r32, r64, infinity}, reportAmount [[ si-RequestForHO-r9 ENUMERATED {setup} OPTIONAL -- Cond reportCGI ]], [[ reportQuantityUTRA-FDD-r10 ENUMERATED {both} OPTTONAL -- Need OR ]], [[ includeLocationInfo-r11 BOOLEAN OPTIONAL -- Need ON ]], [[ b2-Threshold1-v1250 CHOICE { release NULT. setup RSRQ-Range-v1250 } OPTIONAL -- Need ON ]], [[ reportQuantityWLAN-r13 ReportQuantityWLAN-r13 OPTIONAL -- Need ON ]], [[ reportAnyWLAN-r14 BOOLEAN OPTIONAL -- Need ON 11, [[ reportQuantityCellNR-r15 ReportQuantityNR-r15 OPTIONAL. -- Need ON maxReportRS-Index-r15 INTEGER (0..maxRS-IndexReport-r15) OPTIONAL, -- Need ON -- Need ON -- Need ON reportQuantityRS-IndexNR-r15 ReportQuantityNR-r15 OPTIONAL, reportRS-IndexResultsNR BOOLEAN OPTIONAL, ENUMERATED {pSCell, neighborCells } OPTIONAL reportSFTD-Meas-r15 -- Need ON 11 } ThresholdUTRA ::= CHOICE { utra-RSCP INTEGER (-5..91), utra-EcN0 INTEGER (0..49) } ThresholdGERAN ::= INTEGER (0..63) ThresholdCDMA2000 ::= INTEGER (0..63) ReportQuantityNR-r15::= SEQUENCE { ss-rsrp BOOLEAN, ss-rsrq BOOLEAN, ss-sinr BOOLEAN } ReportQuantityWLAN-r13 ::= SEQUENCE { -- Need OR bandRequestWLAN-r13 ENUMERATED {true} OPTIONAL, carrierInfoRequestWLAN-r13 OPTIONAL, -- Need OR ENUMERATED {true} availableAdmissionCapacityRequestWLAN-r13 OPTIONAL, ENUMERATED {true} -- Need OR backhaulDL-BandwidthRequestWLAN-r13 -- Need OR ENUMERATED {true} OPTIONAL, backhaulUL-BandwidthRequestWLAN-r13 ENUMERATED {true} OPTIONAL, -- Need OR ENUMERATED {true} channelUtilizationRequestWLAN-r13 -- Need OR OPTIONAL, -- Need OR stationCountRequestWLAN-r13 ENUMERATED {true} OPTIONAL, . . . }

-- ASN1STOP

ETSI

ReportConfigInterRAT field descriptions
availableAdmissionCapacityRequestWLAN
The value true indicates that the UE shall include, if available, WLAN Available Admission Capacity in measurement
reports. backhaulDL-BandwidthRequestWLAN
The value true indicates that the UE shall include, if available, WLAN Backhaul Downlink Bandwidth in measurement reports.
backhaulUL-BandwidthRequestWLAN
The value true indicates that the UE shall include, if available, WLAN Backhaul Uplink Bandwidth in measurement
reports. bandReguestWLAN
The value true indicates that the UE shall include WLAN band in measurement reports.
<i>bN-ThresholdM</i> Threshold to be used in inter RAT measurement report triggering condition for event number bN. If multiple thresholds are defined for event number bN, the thresholds are differentiated by M.
carrierInfoRequestWLAN The value true indicates that the UE shall include, if available, WLAN Carrier Information in measurement reports.
<i>channelUtilizationRequest-WLAN</i> The value true indicates that the UE shall include, if available, WLAN Channel Utilization in measurement reports.
eventId
Choice of inter-RAT event triggered reporting criteria. maxReportCells
Max number of cells, excluding the serving cell, to include in the measurement report. In case <i>purpose</i> is set to <i>reportStrongestCellsForSON</i> only value 1 applies. For inter-RAT WLAN, it is the maximum number of WLANs to include in the measurement report.
maxReportRS-Index Max number of RS indices to include in the measurement report. E-UTRAN configures value 0 only if it sets reportRS- IndexResultsNR to FALSE.
<b>Purpose</b> reportStrongestCellsForSON applies only in case reportConfig is linked to a measObject set to measObjectUTRA or measObjectCDMA2000.
reportAmount
Number of measurement reports applicable for <i>triggerType event</i> as well as for <i>triggerType periodical</i> . In case <i>purpose</i> is set to <i>reportCGI</i> or reportStrongestCellsForSON only value 1 applies. In case <i>reportSFTD-Meas</i> is configured, only value 1 applies.
reportAnyWLAN
Indicates UE to report any WLAN AP meeting the triggering requirements, even if it is not included in the corresponding <i>MeasObjectWLAN</i> .
<i>reportOnLeave</i> Indicates whether or not the UE shall initiate the measurement reporting procedure when the leaving condition is met for a cell in <i>cellsTriggeredList</i> , as specified in 5.5.4.1.
<i>reportQuantityUTRA-FDD</i> The quantities to be included in the UTRA measurement report. The value <i>both</i> means that both the cpich RSCP and cpich EcN0 quantities are to be included in the measurement report.
<i>reportRS-IndexResultsNR</i> Indicates whether or not the UE shall report beam measurement result of NR in the measurement report.
reportSFTD-Meas
If this field is set to <i>pSCell</i> , the UE shall measure SFTD between the PCell and the PSCell as specified in TS 38.215 [89], in this case, the frequency of PSCell is configured in the corresponding <i>measObjectNR</i> . If the field is set to <i>neighborCells</i> , the UE shall measure SFTD between the PCell and the NR cells included in <i>cellsForWhichToReportSFTD</i> (if configured in the corresponding <i>measObjectNR</i> ) or between the PCell and up to 3 strongest detected NR cells (if <i>cellsForWhichToReportSFTD</i> is not configured in the corresponding <i>measObjectNR</i> ), as specified in TS 38.215 [89]. E-UTRAN only includes this field when setting <i>triggerType</i> to <i>periodical</i> and <i>purpose</i> to <i>reportStrongestCells</i> . If included, the UE shall ignore the <i>maxReportCells</i> field.
si-RequestForHO
The field applies to the <i>reportCGI</i> functionality, and when the field is included, the UE is allowed to use autonomous gaps in acquiring system information from the neighbour cell, applies a different value for T321, and includes different fields in the measurement report. EUTRAN does not configure the field if <i>reportConfig</i> is linked to a <i>measObject</i> set to <i>measObjectNR</i> .
<i>ss-rsrp</i> Indicates whether or not the UE shall report SS-RSRP quantity of NR.
ss-rsrq Indicates whether or not the UE shall report SS-RSRQ quantity of NR.
ss-sinr Indicates whether or not the UE shall report SS-SINR quantity of NR.
stationCountRequestWLAN The value true indicates that the UE shall include, if available, WLAN Station Count in measurement reports.

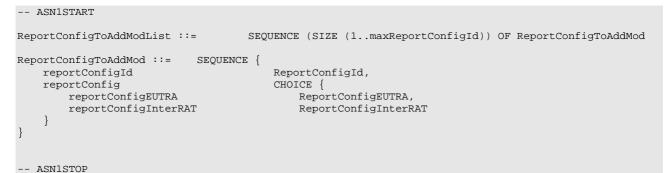
	ReportConfigInterRAT field descriptions
availableAdmissionCapacit	yRequestWLAN
The value true indicates that t	the UE shall include, if available, WLAN Available Admission Capacity in measurement
reports.	
backhauIDL-BandwidthReq	uestWLAN
The value true indicates that t	the UE shall include, if available, WLAN Backhaul Downlink Bandwidth in measurement
reports.	
backhaulUL-BandwidthReq	uestWLAN
The value true indicates that t	the UE shall include, if available, WLAN Backhaul Uplink Bandwidth in measurement
reports.	
bandRequestWLAN	
The value true indicates that t	the UE shall include WLAN band in measurement reports.
b1-ThresholdGERAN, b2-Th	nreshold2GERAN
The actual value is field value	e – 110 dBm.
b1-ThresholdUTRA, b2-Thre	eshold2UTRA
	PICH_RSCP in TS 25.133 [29] for FDD and P-CCPCH_RSCP in TS 25.123 [30] for TDD.
utra-EcN0 corresponds to CP	ICH_Ec/No in TS 25.133 [29] for FDD, and is not applicable for TDD.
For utra-RSCP: The actual va	alue is field value – 115 dBm.
For utra-EcN0: The actual val	ue is (field value – 49)/2 dB.
timeToTrigger	
Time during which specific cri	teria for the event needs to be met in order to trigger a measurement report.
triggerType	
E-UTRAN does not configure	the value periodical in case reportConfig is linked to a measObject set to
measObjectWLAN.	

Conditional presence	Explanation
reportCGI	The field is optional, need OR, in case <i>purpose</i> is included and set to <i>reportCGI</i> ;
	otherwise the field is not present and the UE shall delete any existing value for this field.

### ReportConfigToAddModList

The IE ReportConfigToAddModList concerns a list of reporting configurations to add or modify

### ReportConfigToAddModList information element



ReportInterval

The *ReportInterval* indicates the interval between periodical reports. The *ReportInterval* is applicable if the UE performs periodical reporting (i.e. when *reportAmount* exceeds 1), for *triggerType event* as well as for *triggerType periodical*. Value ms120 corresponds with 120 ms, ms240 corresponds with 240 ms and so on, while value min1 corresponds with 1 min, min6 corresponds with 6 min and so on.

#### ReportInterval information element

ASN1START	
ReportInterval ::=	ENUMERATED { ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, min1, min6, min12, min30, min60, spare3, spare2, spare1}

-- ASN1STOP

### RS-IndexNR

The IE RS-IndexNR is used to identify an NR Reference Signal.

### **RS-IndexNR** information element

ASN1START	
RS-IndexNR-r15 ::=	<pre>INTEGER (0 maxRS-Index-1-r15)</pre>
ASN1STOP	

### - RSRP-Range

The IE *RSRP-Range* specifies the value range used in RSRP measurements and thresholds. Integer value for RSRP measurements according to mapping table in TS 36.133 [16]. A given field using *RSRP-Range-v1360* shall only be signalled if the corresponding original field (using *RSRP-Range* i.e. without suffix) is set to value 0.

#### RSRP-Range information element

ASN1START	
RSRP-Range ::=	<pre>INTEGER(097)</pre>
RSRP-Range-v1360 ::=	INTEGER(-171)
RSRP-RangeSL-r12 ::=	<pre>INTEGER(013)</pre>
RSRP-RangeSL2-r12 ::=	<pre>INTEGER(07)</pre>
RSRP-RangeSL3-r12 ::=	<pre>INTEGER(011)</pre>
RSRP-RangeSL4-r13 ::=	<pre>INTEGER(049)</pre>

-- ASN1STOP

#### RSRP-Range field descriptions

For UE supporting CE Mode B, when CE mode B is not restricted by upper layers,	RSRP-Range-v1360 (i.e., with
suffix) is reported if the measured RSRP is less than -140 dBm.	

#### RSRP-RangeSL

RSRP-Range

Value 0 corresponds to -infinity, value 1 to -115dBm, value 2 to -110dBm, and so on (i.e. in steps of 5dBm) until value 12, which corresponds to -60dBm, while value 13 corresponds to +infinity.

#### RSRP-RangeSL2

Value 0 corresponds to -infinity, value 1 to -110dBm, value 2 to -100dBm, and so on (i.e. in steps of 10dBm) until value 6, which corresponds to -60dBm, while value 7 corresponds to +infinity.

#### RSRP-RangeSL3

Value 0 corresponds to -110dBm, value 1 to -105dBm, value 2 to -100dBm, and so on (i.e. in steps of 5dBm) until value 10, which corresponds to -60dBm, while value 11 corresponds to +infinity.

#### RSRP-RangeSL4

Indicates the range for SD-RSRP. Value 0 corresponds to -130dBm, value 1 to -128dBm, value 2 to -126dBm, and so on (i.e. in steps of 2dBm) until value 48, which corresponds to -34dBm, while value 49 corresponds to +infinity.

### RSRP-RangeNR

The IE *RSRP-RangeNR* specifies the value range used in RSRP measurements and thresholds. For RSRP measurements, integer value is according to mapping table in TS 38.133 [84]. For thresholds, the actual value is (field value – 156) dBm, except for field value 127, in which case the actual value is infinity.

#### RSRP-RangeNR information element

ASN1START	
RSRP-RangeNR-r15 ::=	INTEGER (0127)
ASN1STOP	

### RSRQ-Range

The IE *RSRQ-Range* specifies the value range used in RSRQ measurements and thresholds. Integer value for RSRQ measurements is according to mapping table in TS 36.133 [16]. A given field using *RSRQ-Range-v1250* shall only be signalled if the corresponding original field (using *RSRQ-Range* i.e. without suffix) is set to value 0 or 34. Only a UE indicating support of *extendedRSRQ-LowerRange-r12* or *rsrq-OnAllSymbols-r12* may report *RSRQ-Range-v1250*, and this may be done without explicit configuration from the E-UTRAN. If received, the UE shall use the value indicated by the *RSRQ-Range-v1250* and ignore the value signalled by *RSRQ-Range* (without the suffix). *RSRQ-Range-r13* covers the original range and extended *RSRQ-Range-v1250*. *RSRQ-Range-r13* may be signalled without the corresponding original field and without any requirements for indicated support of *extendedRSRQ-LowerRange-r12* or *rsrq-OnAllSymbols-r13* may be signalled without the corresponding original field and without any requirements for indicated support of *extendedRSRQ-LowerRange-r12* or *rsrq-OnAllSymbols-r13* may be signalled without the corresponding original field and without any requirements for indicated support of *extendedRSRQ-LowerRange-r12* or *rsrq-OnAllSymbols-r12*.

#### **RSRQ-Range** information element

ASN1START	
RSRQ-Range ::=	<pre>INTEGER(034)</pre>
RSRQ-Range-v1250 ::=	<pre>INTEGER(-3046)</pre>
RSRQ-Range-r13 ::=	<pre>INTEGER(-3046)</pre>
ASN1STOP	



### RSRQ-RangeNR

The IE *RSRQ-RangeNR* specifies the value range used in RSRQ measurements and thresholds. For RSRQ measurements, integer value is according to mapping table in TS 38.133 [84]. For thresholds, the actual value is (field value – 87) / 2 dB.

#### RSRQ-RangeNR information element

```
-- ASN1START
RSRQ-RangeNR-r15 ::= INTEGER (0..127)
-- ASN1STOP
```

_

## RSRQ-Type

The IE RSRQ-Type specifies the RSRQ value type used in RSRQ measurements, see TS 36.214 [48].

### RSRQ-Type information element

```
-- ASN1START
RSRQ-Type-r12 ::=
    allSymbols-r12
    wideBand-r12
}
-- ASN1STOP
```

SEQUENCE { BOOLEAN, BOOLEAN

RSRQ-Type field descriptions	
llSymbols	
alue TRUE indicates use of all OFDM symbols when performing RSRQ measurements.	
videBand	
alue TRUE indicates use of a wider bandwidth when performing RSRQ measurements.	

### RS-SINR-Range

The IE RS-SINR-Range specifies the value range used in RS-SINR measurements and thresholds. Integer value for RS-SINR measurements is according to mapping table in TS 36.133 [16].

#### **RS-SINR-Range** information element

..127)

	ASN1START	
RS	-SINR-Range-r13 ::=	INTEGER(0
	ASN1STOP	

### RS-SINR-RangeNR

The IE RS-SINR-RangeNR specifies the value range used in RS-SINR measurements and thresholds. For RS-SINR measurements, integer value is according to mapping table in TS 38.133 [84]. For thresholds, the actual value is (field value – 46) / 2 dB.

### RS-SINR-RangeNR information element

ASNISTART	
RS-SINR-RangeNR-r15	::=

INTEGER (0..127)

-- ASN1STOP

a) 1 a m 7 m

### RSSI-Range-r13

The IE RSSI-Range specifies the value range used in RSSI measurements and thresholds. Integer value for RSSI measurements is according to mapping table in TS 36.133 [16].

#### **RSSI-Range** information element

ASN1START	
RSSI-Range-r13	::=
1 CH1 CHOD	

INTEGER(0..76)

-- ASN1STOP

### SS-RSSI-Measurement

The IE SS-RSSI-Measurement specifies the configuration of NR SSB based RSSI measurements.

#### SS-RSSI-Measurement information element

```
-- ASN1START
SS-RSSI-Measurement-r15 ::=
                                     SEQUENCE {
                                         BIT STRING (SIZE(1..80)),
    measurementSlots-r15
    endSymbol-r15
                                         INTEGER(0..3)
}
```

-- ASN1STOP

#### SS-RSSI-Measurement field descriptions

endSymbol Within a slot that is configured for RSSI measurements (see measurementSlots) the UE measures the RSSI from symbol 0 to symbol endSymbol. This field identifies the entry in Table 5.1.33-1 in TS 36.214 which determines the actual end symbol. measurementSlots

Indicates the slots in which the UE can perform NR RSSI measurements. The length of the BIT STRING is equal to the number of slots in the configured SMTC window (determined by the ssb-duration and by the subcarrierSpacingSSB). The first (left-most / most significant) bit in the bitmap corresponds to the first slot in the SMTC window, the second bit in the bitmap corresponds to the second slot in the SMTC window, and so on. The UE measures in slots for which the corresponding bit in the bitmap is set to 1.

### SSB-ToMeasure

The IE SSB-ToMeasure is used to configure a pattern of SSBs.

#### SSB-ToMeasure information element

```
-- ASN1START
                            CHOICE {
BIT STRING (SIZE (4)),
SSB-ToMeasure-r15 ::=
    shortBitmap-r15
    mediumBitmap-r15
                                   BIT STRING (SIZE (8)),
    longBitmap-r15
                                    BIT STRING (SIZE (64))
}
-- ASN1STOP
```

SSB-ToMeasure field descriptions

longBitmap Bitmap when maximum number of SS/PBCH blocks per half frame equals to 64 as defined in TS 38.213 [88], clause 4.1. mediumBitmap

Bitmap when maximum number of SS/PBCH blocks per half frame equals to 8 as defined in TS 38.213 [88], clause 4.1. shortBitmap

Bitmap when maximum number of SS/PBCH blocks per half frame equals to 4 as defined in TS 38.213 [88], clause 4.1.

### TimeToTrigger

The IE *TimeToTrigger* specifies the value range used for time to trigger parameter, which concerns the time during which specific criteria for the event needs to be met in order to trigger a measurement report. Value ms0 corresponds to 0 ms and behaviour as specified in 7.3.2 applies, ms40 corresponds to 40 ms, and so on.

#### TimeToTrigger information element

ASN1START	
TimeToTrigger ::=	ENUMERATED { ms0, ms40, ms64, ms80, ms100, ms128, ms160, ms256, ms320, ms480, ms512, ms640, ms1024, ms1280, ms2560, ms5120}
ASN1STOP	

### UL-DelayConfig

The IE UL-DelayConfig IE specifies the configuration of the UL PDCP Packet Delay per QCI measurement specified in TS 36.314 [71].

### UL-DelayConfig information element

ASN1START	
UL-DelayConfig-r13 ::= release setup delayThreshold-r13 }	CHOICE { NULL, SEQUENCE { ENUMERATED { ms30, ms40, ms50, ms60, ms70, ms80, ms90,ms100, ms150, ms300, ms750, spare4, spare3, spare2, spare1}
} ASN1STOP	

#### UL-DelayConfig field descriptions

*delayThreshold* Indicates the delay threshold value used by UE to provide results of UL PDCP Packet Delay per QCI measurement as specified in TS 36.314 [71]. Value in milliseconds. Value ms30 means 30 ms and so on.

WLAN-CarrierInfo

The IE WLAN-CarrierInfo is used to identify the WLAN frequency band information, as specified in Annex E in [67].

### WLAN-CarrierInfo information element

```
-- ASN1START
WLAN-CarrierInfo-r13 ::= SEQUENCE {
    operatingClass-r13 INTEGER (0..255) OPTIONAL, -- Need ON
    countryCode-r13 ENUMERATED {unitedStates, europe, japan, global, ...}
    OPTIONAL, -- Need ON
    channelNumbers-r13 WLAN-ChannelList-r13 OPTIONAL, -- Need ON
    ...
}
WLAN-ChannelList-r13 ::= SEQUENCE (SIZE (1..maxWLAN-Channels-r13)) OF WLAN-Channel-r13
WLAN-Channel-r13 ::= INTEGER(0..255)
-- ASN1STOP
```

WLAN-CarrierInfo field descriptions		
channelNumbers		
Indicates the WLAN channels as defined in IEEE 802.11-2012 [67]. Value 0 is not used.		
countryCode		
Indicates the country code of WLAN as defined in IEEE 802.11-2012 [67].		
operatingClass		
Indicates the Operating Class of WLAN as defined in IEEE 802.11-2012 [67].		

### WLAN-NameList

The IE WLAN-NameList is used to indicate the names of the WLAN AP for which the UE is configured to measure.

### WLAN-NameList information element

```
-- ASN1START

WLAN-NameListConfig-r15 ::= CHOICE{

release NULL,

setup WLAN-NameList-r15

}

WLAN-NameList-r15 ::= SEQUENCE (SIZE (1..maxWLAN-Name-r15)) OF WLAN-Name-r15

WLAN-Name-r15 ::= OCTET STRING (SIZE (1..32))
```

-- ASN1STOP

#### WLAN-NameList field descriptions

WLAN-Name If configured, the UE only performs WLAN measurements according to the names identified. For each name, it refers to Service Set Identifier (SSID) defined in IEEE 802.11-2012 [67].

### WLAN-RSSI-Range

The IE *WLAN-RSSI-Range* specifies the value range used in WLAN RSSI measurements and thresholds. Integer value for WLAN RSSI measurements is according to mapping table in TS 36.133 [16]. Value 0 corresponds to -infinity, value 1 to -100dBm, value 2 to -99dBm, and so on (i.e. in steps of 1dBm) until value 140, which corresponds to 39dBm, while value 141 corresponds to +infinity.

#### WLAN-RSSI-Range information element

ASN1START	
WLAN-RSSI-Range-r13 ::=	INTEGER(0141)
ASN1STOP	

– WLAN-RTT

The IE *WLAN-RTT* covers the measured round trip time between the target device and WLAN AP and optionally the accuracy expressed as the standard deviation of the delay.

#### WLAN-RTT information element

```
-- ASN1START
WLAN-RTT-r15 ::= SEQUENCE {
   rttValue-r15
                                     INTEGER (0..16777215),
    rttUnits-r15
                                     ENUMERATED {
                                                    microseconds,
                                     hundredsofnanoseconds,
                                     tensofnanoseconds,
                                     nanoseconds,
                                     tenthsofnanoseconds,
                                     . . .
                                 INTEGER (0..255)
                                                                              OPTIONAL,
    rttAccuracy-r15
}
```

-- ASN1STOP

rttValue

#### WLAN-RTT field descriptions

This field specifies the Round Trip Time (RTT) measurement between the target device and WLAN AP in units given by the field rttUnits as defined in TS 36.355 [54].

rttUnits

This field specifies the Units for the fields rttValue and rttAccuracy. The available Units are 1000ns, 100ns, 10ns, 1ns, and 0.1ns as defined in TS 36.355 [54].

rttAccuracy

This field provides the estimated accuracy of the provided rttValue expressed as the standard deviation in units given by the field rttUnits as defined in TS 36.355 [54].

### WLAN-Status

The IE *WLAN-Status* indicates the current status of WLAN connection. The values are set as described in clause 5.6.15.2 and 5.6.15.4.

### WLAN-Status information element

```
-- ASN1START
WLAN-Status-r13 ::= ENUMERATED {successfulAssociation, failureWlanRadioLink,
failureWlanUnavailable, failureTimeout}
WLAN-Status-v1430 ::= ENUMERATED {suspended, resumed}
-- ASN1STOP
```

### WLAN-SuspendConfig

The IE WLAN-SuspendConfig is used for configuration of WLAN suspend/resume functionality.

```
-- ASN1START
WLAN-SuspendConfig-r14 ::= SEQUENCE {
   wlan-SuspendResumeAllowed-r14 BOOLEAN OPTIONAL, -- Need ON
   wlan-SuspendTriggersStatusReport-r14 BOOLEAN OPTIONAL -- Need ON
}
```

-- ASN1STOP

#### WLAN-SuspendConfig field descriptions

 wlan-SuspendResumeAllowed

 Indicates whether the UE is allowed to use suspend-resume mechanism, i.e., to indicate WLAN being temporarily unavailable and WLAN being available again after temporary unavailability.

 wlan-SuspendTriggersStatusReport

 Indicates whether the UE shall trigger PDCP status report as defined in TS 36.323 [8] when WLAN is temporarily unavailable and UE reports this status.

# 6.3.6 Other information elements

### AbsoluteTimeInfo

The IE *AbsoluteTimeInfo* indicates an absolute time in a format YY-MM-DD HH:MM:SS and using BCD encoding. The first/ leftmost bit of the bit string contains the most significant bit of the most significant digit of the year and so on.

### AbsoluteTimeInfo information element

```
AbsoluteTimeInfo-r10 ::=
```

BIT STRING (SIZE (48))

-- ASN1STOP

-- ASN1START

### AMF-Identifier

The IE *AMF-Identifier* (AMFI) comprises of an AMF Region ID, an AMF Set ID and an AMF Pointer as specified in 23.003 [27], clause 2.10.1.

### AMF-Identifier information element

```
-- ASN1START
AMF-Identifier-r15 ::= BIT STRING (SIZE (24))
-- ASN1STOP
```

### AreaConfiguration

The *AreaConfiguration* indicates area for which UE is requested to perform measurement logging. If not configured, measurement logging is not restricted to specific cells or tracking areas but applies as long as the RPLMN is contained in *plmn-IdentityList* stored in *VarLogMeasReport*.

#### AreaConfiguration information element

```
-- ASN1START
AreaConfiguration-r10 ::= CHOICE {
   cellGlobalIdList-r10
                                   CellGlobalIdList-r10,
   trackingAreaCodeList-r10
                                   TrackingAreaCodeList-r10
}
AreaConfiguration-v1130 ::= SEQUENCE {
   trackingAreaCodeList-v1130 TrackingAreaCodeList-v1130
}
CellGlobalIdList-r10 ::=
                                       SEQUENCE (SIZE (1..32)) OF CellGlobalIdEUTRA
TrackingAreaCodeList-r10 ::=
                                       SEQUENCE (SIZE (1..8)) OF TrackingAreaCode
TrackingAreaCodeList-v1130 ::= SEQUENCE {
   plmn-Identity-perTAC-List-r11
                                           SEQUENCE (SIZE (1..8)) OF PLMN-Identity
```

-- ASN1STOP

AreaConfiguration field descriptions

*plmn-Identity-perTAC-List* Includes the PLMN identity for each of the TA codes included in *trackingAreaCodeList*. The PLMN identity listed first in *plmn-Identity-perTAC-List* corresponds with the TA code listed first in *trackingAreaCodeList* and so on.

### BandCombinationList

The IE BandCombinationList contains a list of CA band combinations.

#### BandCombinationList information element

– C-RNTI

The IE C-RNTI identifies a UE having a RRC connection within a cell.

### **C-RNTI** information element

-- ASN1START C-RNTI ::=

BIT STRING (SIZE (16))

-- ASN1STOP

ETSI

# DedicatedInfoCDMA2000

The *DedicatedInfoCDMA2000* is used to transfer UE specific CDMA2000 information between the network and the UE. The RRC layer is transparent for this information.

#### DedicatedInfoCDMA2000 information element

ASN1START	
DedicatedInfoCDMA2000 ::=	OCTET STRING
ASN1STOP	

# – DedicatedInfoNAS

The IE *DedicatedInfoNAS* is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for this information.

#### DedicatedInfoNAS information element

ASN1START			
DedicatedInfoNAS	::=	OCTET	STRING
ASN1STOP			

# – FilterCoefficient

The IE *FilterCoefficient* specifies the measurement filtering coefficient. Value fc0 corresponds to k = 0, fc1 corresponds to k = 1, and so on.

## FilterCoefficient information element

```
FilterCoefficient ::= ENUMERATED {
fc0, fc1, fc2, fc3, fc4, fc5,
fc6, fc7, fc8, fc9, fc11, fc13,
fc15, fc17, fc19, spare1, ...}
```

-- ASN1STOP

-- ASN1START

# FlightPathInfoReportConfig

The IE FlightPathInfoReportConfig speficies flight path information report configuration.

## FlightPathInfoReportConfig information element

```
-- ASN1START
FlightPathInfoReportConfig-r15 ::= SEQUENCE {
    maxWayPointNumber-r15 INTEGER (1..maxWayPoint-r15),
    includeTimeStamp-r15 ENUMERATED {true} OPTIONAL
}
-- ASN1STOP
```

# FlightPathInfoReportConfig field descriptions maxWayPointNumber Indicates the maximum number of way points UE can include in the flight path information report if this information is available at the UE. includeTimeStamp Indicates whether time stamp of each way point can be reported in the flight path information report if time stamp information is available at the UE.

## GNSS-ID

The IE GNSS-ID is used to indicate a specific GNSS (see also TS 36.355 [54]).

```
-- ASN1START
GNSS-ID-r15 ::= SEQUENCE {
    gnss-id-r15 ENUMERATED{gps, sbas, qzss, galileo, glonass, bds, ...},
    ...
}
```

-- ASN1STOP

## I-RNTI

The I-RNTI IE is used to identify the suspended UE context of a UE in RRC_INACTIVE.

# *I-RNTI* information element

ASN1START	
I-RNTI-r15 ::=	BIT STRING (SIZE(40))
ASN1STOP	

# LoggingDuration

The *LoggingDuration* indicates the duration for which UE is requested to perform measurement logging. Value min10 corresponds to 10 minutes, value min20 corresponds to 20 minutes and so on.

# LoggingDuration information element

ASN1START							
LoggingDuration-r10 ::=	ENUMERATED min10,	min40,	min60,	min90,	min120,	spare2,	spare1}
ASN1STOP							

# LoggingInterval

-- ASN1START

The *LoggingInterval* indicates the periodicity for logging measurement results. Value ms1280 corresponds to 1.28s, value ms2560 corresponds to 2.56s and so on.

## LoggingInterval information element

LoggingInterval-r10 ::=	ENUMERATED {
	ms1280, ms2560, ms5120, ms10240, ms20480, ms30720, ms40960, ms61440}
ASN1STOP	

# MeasSubframePattern

The IE *MeasSubframePattern* is used to specify a subframe pattern. The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where SFN is that of PCell and x is the size of the bit string divided by 10. "1" denotes that the corresponding subframe is used.

#### MeasSubframePattern information element

```
-- ASN1START

MeasSubframePattern-r10 ::= CHOICE {

    subframePatternFDD-r10 BIT STRING (SIZE (40)),

    subframeConfig1-5-r10 BIT STRING (SIZE (20)),

    subframeConfig0-r10 BIT STRING (SIZE (20)),

    subframeConfig6-r10 BIT STRING (SIZE (70)),

    subframeConfig6-r10 BIT STRING (SIZE (60)),

    ...

    },

    ...
```

-- ASN1STOP

#### MMEC

The IE MMEC identifies an MME within the scope of an MME Group within a PLMN, see TS 23.003 [27].

#### **MMEC** information element

ASN1START	
MMEC ::=	BIT STRING (SIZE (8))
ASN1STOP	

# NeighCellConfig

The IE *NeighCellConfig* is used to provide the information related to MBSFN and TDD UL/DL configuration of neighbour cells.

## NeighCellConfig information element

ASN1START	
NeighCellConfig ::=	BIT STRING (SIZE (2))
Neigheetteonitig	
ASN1STOP	

#### NeighCellConfig field descriptions

neighCellConfig
Provides information related to MBSFN and TDD UL/DL configuration of neighbour cells of this frequency
00: Not all neighbour cells have the same MBSFN subframe allocation as the serving cell on this frequency, if
configured, and as the PCell otherwise
10: The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cell on this
frequency, if configured, and of that in the PCell otherwise
01: No MBSFN subframes are present in all neighbour cells
11: Different UL/DL allocation in neighbouring cells for TDD compared to the serving cell on this frequency, if
configured, and compared to the PCell otherwise
For TDD, 00, 10 and 01 are only used for same UL/DL allocation in neighbouring cells compared to the serving cell on this frequency, if configured, and compared to the PCell otherwise.

# NG-5G-S-TMSI

The IE *NG-5G-S-TMSI* contains a 5G S-Temporary Mobile Subscriber Identity, a temporary UE identity provided by the AMF which uniquely identifies the UE within the tracking area, see TS 23.003 [27].

#### NG-5G-S-TMSI information element

```
-- ASN1START
NG-5G-S-TMSI-r15::= BIT STRING (SIZE (48))
-- ASN1STOP
```

– OtherConfig

-- ASN1START

The IE OtherConfig contains configuration related to other configuration.

#### OtherConfig information element

```
OtherConfig-r9 ::= SEQUENCE {
   reportProximityConfig-r9
                                     ReportProximityConfig-r9
                                                                    OPTIONAL,
                                                                                -- Need ON
    [[ idc-Config-r11
                                      IDC-Config-r11
                                                                    OPTIONAL.
                                                                                -- Need ON
       -- Need ON
       obtainLocationConfig-r11 ObtainLocationConfig-r11
                                                                    OPTIONAL
                                                                                -- Need ON
    ]],
   [ bw-PreferenceIndicationTimer-r14
                                         ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20,
                                            s30, s60, s90, s120, s300, s600, spare3,
                                             spare2, spare1} OPTIONAL, -- Need OR
LEAN OPTIONAL, -- Need ON
       sps-AssistanceInfoReport-r14
                                         BOOLEAN
       delayBudgetReportingConfig-r14 CHOICE{
           release
                                  NULL.
           setup
                                  SEOUENCE {
               delayBudgetReportingProhibitTimer-r14 ENUMERATED {
                                                            s0, s0dot4, s0dot8,
                                                             sldot6, s3, s6, s12, s30}
           }
                                                                    OPTIONAL, -- Need ON
       rlm-ReportConfig-r14
                                     CHOICE {
           release
                                  NULL,
                                  SEQUENCE {
           setup
               rlmReportTimer-r14
                                             ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, s30,
                                             s60, s90, s120, s300, s600, spare3, spare2, spare1},
               rlmReportRep-MPDCCH-r14
                                             ENUMERATED {setup}
                                                                  OPTIONAL
                                                                                -- Need OR
       }
           OPTIONAL -- Need ON
    ]],
      overheatingAssistanceConfig-r14 CHOICE{
    [[
           release
                                  NULL,
           setup
                                  SEQUENCE {
               overheatingIndicationProhibitTimer-r14 ENUMERATED {s0, s0dot5, s1, s2, s5, s10,
                                                     s20, s30, s60, s90, s120, s300, s600,
                                                     spare3, spare2, spare1}
       }
                         -- Need ON
           OPTIONAL
   ]],
      measConfigAppLayer-r15
                                  CHOICE {
   [[
           release
                                  NULL.
                                  SEOUENCE {
           setup
               measConfigAppLayerContainer-r15
                                                 OCTET STRING (SIZE(1..1000)),
              serviceType
                                               ENUMERATED {qoe, qoemtsi, spare6, spare5,
spare4, spare3, spare2, spare1}
          OPTIONAL, -- Need ON
       ailc-BitConfig-r15 BOOLEAN
bt-NameListConfig-r15 BT-NameListConfig-r15
                                                                    OPTIONAL,
                                                                               -- Need ON
                                                                      OPTIONAL, --Need ON
       wlan-NameListConfig-r15 WLAN-NameListConfig-r15
                                                                        OPTIONAL
                                                                                        --Need
ON
   ]]
}
```

IDC-Config-rll ::= SEQUENCE { idc-Indication-rll ENUN idc-Indication-r11 ENUMERATED {setup} autonomousDenialParameters-r11 SEQUENCE { OPTIONAL, -- Need OR autonomousDenialSubframes-r11 ENUMERATED {n2, n5, n10, n15, n20, n30, spare2, spare1}, autonomousDenialValidity-r11 ENUMERATED { sf200, sf500, sf1000, sf2000, spare4, spare3, spare2, spare1} } OPTIONAL, -- Need OR [[ idc-Indication-UL-CA-r11 ENUMERATED {setup} OPTIONAL -- Cond idc-Ind ]], [[ idc-HardwareSharingIndication-r13 ENUMERATED {setup} OPTIONAL -- Need OR ]], [[ idc-Indication-MRDC-r15 CHOIC: release NULL, CHOICE { CandidateServingFreqListNR-r15 setup OPTIONAL -- Cond idc-Ind } ]] } ObtainLocationConfig-r11 ::= SEQUENCE { OPTIONAL -- Need OR obtainLocation-r11 ENUMERATED {setup} } PowerPrefIndicationConfig-r11 ::= CHOICE{ release NULL, SEQUENCE { setup ENUMERATED {s0, s0dot5, s1, s2, s5, s10, s20, powerPrefIndicationTimer-r11 s30, s60, s90, s120, s300, s600, spare3, spare2, spare1} } } ReportProximityConfig-r9 ::= SEQUENCE { proximityIndicationEUTRA-r9 ENUMERATED {enabled} OPTIONAL, -- Need OR proximityIndicationUTRA-r9 ENUMERATED {enabled} OPTIONAL -- Need OR -- Need OR } CandidateServingFreqListNR-r15 ::= SEQUENCE (SIZE (1..maxFreqIDC-r11)) OF ARFCN-ValueNR-r15

-- ASN1STOP

OtherConfig field descriptions	
ailc-BitConfig	
Indicates whether the UE is allowed to provide assistance information bit for local cache. If configured, t	he UE shall
only apply to a DRB configured with 12-bit PDCP SN format as specified in TS 36.323 [8].	
autonomousDenialSubframes	
Indicates the maximum number of the UL subframes for which the UE is allowed to deny any UL transm	ission. Value
n2 corresponds to 2 subframes, n5 to 5 subframes and so on. E-UTRAN does not configure autonomou	
frequencies on which SCG cells are configured.	
autonomousDenialValidity	
Indicates the validity period over which the UL autonomous denial subframes shall be counted. Value sf	200
corresponds to 200 subframes, sf500 corresponds to 500 subframes and so on.	200
bw-PreferenceIndicationTimer	
Prohibit timer for bandwidth preference indication reporting. Value in seconds. Value s0 means prohibit	timor is cot to
0 second, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to	
	r second and
so on.	
CandidateServingFreqListNR	
Indicates the candidate NR serving frequencies that are subject to IDC indication for MR-DC.	
delayBudgetReportingProhibitTimer	
Prohibit timer for delay budget reporting. Value in seconds. Value s0 means prohibit timer is set to 0 sec	cond, value
s0dot4 means prohibit timer is set to 0.4 second, and so on.	
idc-HardwareSharingIndication	
The field is used to indicate whether the UE is allowed indicate in InDeviceCoexIndication that the cause	
problems are due to hardware sharing, and whether the UE is allowed to omit the TDM assistance inform	mation.
idc-Indication	
The field is used to indicate whether the UE is configured to initiate transmission of the InDeviceCoexInd	dication
message to the network.	
idc-Indication-MRDC	
The field is used to indicate whether the UE is configured to provide IDC indications for MR-DC using th	е
InDeviceCoexIndication message.	
idc-Indication-UL-CA	
The field is used to indicate whether the UE is configured to provide IDC indications for UL CA using the	<del>)</del>
InDeviceCoexIndication message.	
measConfigAppLayerContainer	
The field contains configuration of application layer measurements, see Annex L (normative) in TS 26.2	47 [90] and
clause 16.5 in TS 26.114 [99].	[]
serviceType	
Indicates the type of application layer measurement. Value goe indicates Quality of Experience Measure	ement
Collection for streaming services, value qoemtsi indicates Enhanced Quality of Experience Measurement	
for MTSI.	
obtainLocation	
Requests the UE to attempt to have detailed location information available using GNSS. E-UTRAN conf	igures the field
	igures the held
only if <i>includeLocationInfo</i> is configured for one or more measurements.	
overheatingAssistanceConfig	workeetin -
Configuration for the UE to report assistance information to inform the eNB about UE detected internal of	overneating.
overheatingIndicationProhibitTimer	hitata i
Prohibit timer for overheating assistance information reporting. Value in seconds. Value s0 means prohi	
to 0 seconds, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set	et to 1 second
and so on.	
powerPrefIndicationTimer	
Prohibit timer for Power Preference Indication reporting. Value in seconds. Value s0 means prohibit time	
second, value s0dot5 means prohibit timer is set to 0.5 second, value s1 means prohibit timer is set to 1	second and
so on.	
reportProximityConfig	
Indicates, for each of the applicable RATs (EUTRA, UTRA), whether or not proximity indication is enable	ed for CSG
member cell(s) of the concerned RAT. Note.	
rImReportTimer	
Prohibit timer for RLM event reporting, i.e. "early-out-of-sync" and "early-in-sync" event reporting, as specific	ecified in
clause 5.6.10. Value in seconds. Value s0 means prohibit timer is set to 0 second, value s0dot5 means	
The near second of maloute mount and on the open open choose repetitions of the DOOT.	
sps-AssistanceInfoReport	
<i>rImReportRep-MPDCCH</i> The field is used to indicate whether the UE is configured to report excess repetitions on MPDCCH.	

NOTE: Enabling/ disabling of proximity indication includes enabling/ disabling of the related functionality e.g. autonomous search in connected mode.

Conditional presence		Explanation
	idc-Ind	The field is optionally present if <i>idc-Indication</i> is present, need OR. Otherwise the field is
		not present.

# RAN-AreaCode

The RAN-AreaCode IE indicates RAN area code of the cell.

#### RAN-AreaCode information element

```
-- ASN1START
```

RAN-AreaCode-r15 ::=

INTEGER (0..255)

-- ASN1STOP

# RAND-CDMA2000 (1xRTT)

The RAND-CDMA2000 concerns a random value, generated by the eNB, to be passed to the CDMA2000 upper layers.

#### RAND-CDMA2000 information element

RAND-CDMA2000 ::=

BIT STRING (SIZE (32))

-- ASN1STOP

-- ASN1START

_

# RAT-Type

The IE *RAT-Type* is used to indicate the radio access technology (RAT), including E-UTRA, of the requested/ transferred UE capabilities. A separate value applies for some EUTRA-NR capabilities that are transferred by a separate UE capability container, used in case of MR-DC.

## **RAT-Type** information element

```
RAT-Type ::= ENUMERATED {
eutra, utra, geran-cs, geran-ps, cdma2000-1XRTT,
nr, eutra-nr, spare1, ...}
```

-- ASN1STOP

-- ASN1START

## Resumeldentity

The IE ResumeIdentity is used to identify the suspended UE context

## Resumeldentity information element

```
-- ASN1START
ResumeIdentity-r13 ::= BIT STRING (SIZE(40))
-- ASN1STOP
```

# RRC-TransactionIdentifier

The IE *RRC-TransactionIdentifier* is used, together with the message type, for the identification of an RRC procedure (transaction).

## **RRC-TransactionIdentifier** information element

```
-- ASN1START
RRC-TransactionIdentifier ::= INTEGER (0..3)
-- ASN1STOP
```

_

# SBAS-ID

The IE SBAS-ID is used to indicate a specific SBAS (see also TS 36.355 [54]).

ShortI-RNTI

The *ShortI-RNTI* IE is used to identify the suspended UE context of a UE in RRC_INACTIVE using fewer bits compared to *I-RNTI*.

## ShortI-RNTI information element

BIT STRING (SIZE(24))

-- ASN1START ShortI-RNTI-r15 ::=

-- ASN1STOP

# S-NSSAI

The IE *S-NSSAI* identifies a Network Slice end to end and comprises a slice/service type and a slice differentiator, see TS 23.003 [27].

## S-NSSAI information element

ASN1START					
S-NSSAI-r15 ::=	CHOICE {				
sst		BIT	STRING	(SIZE	(8)),
sst-SD		BIT	STRING	(SIZE	(32))
}					

-- ASN1STOP

	S-NSSA/ field descriptions
sst	
Indicates th	e S-NSSAI consists of Slice/Service Type, see TS 23.003 [27].
sst-SD	
Indicates th	e S-NSSAI consists of Slice/Service Type and Slice Differentiator, see TS 23.003 [27].

S-TMSI

The IE *S*-*TMSI* contains an S-Temporary Mobile Subscriber Identity, a temporary UE identity provided by the EPC which uniquely identifies the UE within the tracking area, see TS 23.003 [27].

# S-TMSI information element

-- ASN1START

```
S-TMSI ::=
mmec
m-TMSI
}
```

SEQUENCE { MMEC, BIT STRING (SIZE (32))

-- ASN1STOP

m-TMSI

#### S-TMSI field descriptions

The first/leftmost bit of the bit string contains the most significant bit of the M-TMSI.

# TraceReference

The TraceReference contains parameter Trace Reference as defined in TS 32.422 [58].

SEQUENCE {

PLMN-Identity,

OCTET STRING (SIZE (3))

## TraceReference information element

```
-- ASN1START
TraceReference-r10 ::=
    plmn-Identity-r10
    traceId-r10
}
-- ASN1STOP
```

UE-CapabilityRAT-ContainerList

The IE UE-CapabilityRAT-ContainerList contains list of containers, one for each RAT for which UE capabilities are transferred, if any.

## UE-CapabilityRAT-ContainerList information element

#### UECapabilityRAT-ContainerList field descriptions

#### ueCapabilityRAT-Container

Container for the UE capabilities of the indicated RAT. The encoding is defined in the specification of each RAT: For E-UTRA: the encoding of UE capabilities is defined in IE *UE-EUTRA-Capability*.

For UTRA: the octet string contains the INTER RAT HANDOVER INFO message defined in TS 25.331 [19]. For GERAN CS: the octet string contains the concatenated string of the Mobile Station Classmark 2 and Mobile Station Classmark 3. The first 5 octets correspond to Mobile Station Classmark 2 and the following octets correspond to Mobile Station Classmark 3. The Mobile Station Classmark 2 is formatted as 'TLV' and is coded in the same way as the *Mobile Station Classmark 2* information element in TS 24.008 [49]. The first octet is the *Mobile station classmark 2 IEI* and its value shall be set to 33H. The second octet is the *Length of mobile station classmark 2* and its value shall be set to 3. The octet 3 contains the first octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element, the octet 4 contains the second octet of the value part of the *Mobile Station Classmark 2* information element and so on. For each of these octets, the first/ leftmost/ most significant bit of the octet contains b8 of the corresponding octet of the Mobile Station Classmark 2. The Mobile Station Classmark 3 is formatted as 'V' and is coded in the same way as the value part in the *Mobile station classmark 3* information element in TS 24.008 [49]. The sixth octet of this octet string contains octet 1 of the value part of *Mobile station classmark 3*, the seventh of octet of this octet string contains octet 2 of the value part of *Mobile station classmark 3* and so on. Note.

For GERAN PS: the encoding of UE capabilities is formatted as 'V' and is coded in the same way as the value part in the *MS Radio Access Capability* information element in TS 24.008 [49].

For CDMA2000-1XRTT: the octet string contains the A21 Mobile Subscription Information and the encoding of this is defined in A.S0008 [33]. The A21 Mobile Subscription Information contains the supported CDMA2000 1xRTT band class and band sub-class information.

For NR: The octet string contains the IE UE-NR-Capability as defined in TS 38.331 [82]. For EUTRA-NR: The octet string contains the IE UE-MRDC-Capability as defined in TS 38.331 [82]

- NOTE: The value part is specified by means of CSN.1, which encoding results in a bit string, to which final padding may be appended up to the next octet boundary TS 24.008 [49]. The first/ leftmost bit of the CSN.1 bit string is placed in the first/ leftmost/ most significant bit of the first octet. This continues until the last bit of the CSN.1 bit string, which is placed in the last/ rightmost/ least significant bit of the last octet.
  - UE-EUTRA-Capability

The IE *UE-EUTRA-Capability* is used to convey the E-UTRA UE Radio Access Capability Parameters, see TS 36.306 [5], and the Feature Group Indicators for mandatory features (defined in Annexes B.1 and C.1) to the network. The IE *UE-EUTRA-Capability* is transferred in E-UTRA or in another RAT.

NOTE 0: For (UE capability specific) guidelines on the use of keyword OPTIONAL, see Annex A.3.5.

# **UE-EUTRA-Capability** information element

ASN1START		
accessStratumRelease ue-Category pdcp-Parameters phyLayerParameters rf-Parameters measParameters featureGroupIndicators interRAT-Parameters utraFDD	JENCE { AccessStratumRelease, INTEGER (15), PDCP-Parameters, PhyLayerParameters, RF-Parameters, MeasParameters, BIT STRING (SIZE (32)) SEQUENCE { IRAT-ParametersUTRA-FDD	OPTIONAL, OPTIONAL,
<pre>utraTDD128 utraTDD384 utraTDD768 geran cdma2000-HRPD cdma2000-1xRTT },</pre>	IRAT-ParametersUTRA-TDD128 IRAT-ParametersUTRA-TDD384 IRAT-ParametersUTRA-TDD768 IRAT-ParametersGERAN IRAT-ParametersCDMA2000-HRPD IRAT-ParametersCDMA2000-1XRTT	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
<pre>nonCriticalExtension }</pre>	UE-EUTRA-Capability-v920-IEs	OPTIONAL
Late non critical extensions UE-EUTRA-Capability-v9a0-IEs ::= featureGroupIndRel9Add-r9 fdd-Add-UE-EUTRA-Capabilities-r9 tdd-Add-UE-EUTRA-Capabilities-r9 nonCriticalExtension		OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL

}		
<pre>UE-EUTRA-Capability-v9c0-IEs ::= interRAT-ParametersUTRA-v9c0 nonCriticalExtension }</pre>		PTIONAL, PTIONAL
UE-EUTRA-Capability-v9d0-IEs ::= phyLayerParameters-v9d0 nonCriticalExtension }		PTIONAL, PTIONAL
UE-EUTRA-Capability-v9e0-IEs ::= rf-Parameters-v9e0 nonCriticalExtension }	SEQUENCE { RF-Parameters-v9e0 UE-EUTRA-Capability-v9h0-IEs	OPTIONAL, OPTIONAL
<pre>UE-EUTRA-Capability-v9h0-IEs ::= interRAT-ParametersUTRA-v9h0  Following field is only to 1 lateNonCriticalExtension nonCriticalExtension }</pre>	SEQUENCE { IRAT-ParametersUTRA-v9h0 be used for late REL-9 extensions OCTET STRING UE-EUTRA-Capability-v10c0-IEs	OPTIONAL, OPTIONAL, OPTIONAL
<pre>UE-EUTRA-Capability-v10c0-IEs ::=     otdoa-PositioningCapabilities-:     nonCriticalExtension }</pre>	SEQUENCE { rl0 OTDOA-PositioningCapabilities-rl0 UE-EUTRA-Capability-vl0f0-IEs	OPTIONAL, OPTIONAL
UE-EUTRA-Capability-v10f0-IEs ::= rf-Parameters-v10f0 nonCriticalExtension }	SEQUENCE { RF-Parameters-v10f0 UE-EUTRA-Capability-v10i0-IEs	OPTIONAL, OPTIONAL
UE-EUTRA-Capability-v10i0-IEs ::= rf-Parameters-v10i0 Following field is only to 1 lateNonCriticalExtension OPTIONAL, nonCriticalExtension	SEQUENCE { RF-Parameters-v10i0 be used for late REL-10 extensions OCTET STRING (CONTAINING UE-EUTRA UE-EUTRA-Capability-v11d0-IEs	OPTIONAL, -Capability-v10j0-IEs) OPTIONAL
}	UE-EUTRA-Capadility-VIIU0-IES	OPIIONAL
UE-EUTRA-Capability-v10j0-IEs ::= rf-Parameters-v10j0 nonCriticalExtension }	SEQUENCE { RF-Parameters-v10j0 SEQUENCE {}	OPTIONAL, OPTIONAL
<pre>UE-EUTRA-Capability-v11d0-IEs ::=     rf-Parameters-v11d0     otherParameters-v11d0     nonCriticalExtension }</pre>	SEQUENCE { RF-Parameters-v11d0 Other-Parameters-v11d0 UE-EUTRA-Capability-v11x0-IEs	OPTIONAL, OPTIONAL, OPTIONAL
<pre>UE-EUTRA-Capability-v11x0-IEs ::=     Following field is only to I     lateNonCriticalExtension     nonCriticalExtension }</pre>	SEQUENCE { be used for late REL-11 extensions OCTET STRING UE-EUTRA-Capability-v12b0-IEs	OPTIONAL, OPTIONAL
UE-EUTRA-Capability-v12b0-IEs ::= rf-Parameters-v12b0 nonCriticalExtension }	SEQUENCE { RF-Parameters-v12b0 UE-EUTRA-Capability-v12x0-IEs	OPTIONAL, OPTIONAL
<pre>UE-EUTRA-Capability-v12x0-IEs ::=  Following field is only to lateNonCriticalExtension nonCriticalExtension }</pre>	SEQUENCE { be used for late REL-12 extensions OCTET STRING UE-EUTRA-Capability-v1370-IES	OPTIONAL, OPTIONAL
	SEQUENCE { CE-Parameters-v1370 v1370 UE-EUTRA-CapabilityAddXDD-Mode-v1 v1370 UE-EUTRA-CapabilityAddXDD-Mode-v1 UE-EUTRA-Capability-v1380-IEs	
J UE-EUTRA-Capability-v1380-IEs ::= ;	SEQUENCE {	

rf-Parameters-v1380 RF-Parameters-v1380 OPTIONAL, ce-Parameters-v1380 CE-Parameters-v1380, fdd-Add-UE-EUTRA-Capabilities-v1380 UE-EUTRA-CapabilityAddXDD-Mode-v1380, tdd-Add-UE-EUTRA-Capabilities-v1380 UE-EUTRA-CapabilityAddXDD-Mode-v1380, nonCriticalExtension UE-EUTRA-Capability-v1390-IEs OPTTONAL. } UE-EUTRA-Capability-v1390-IEs ::= SEQUENCE { rf-Parameters-v1390 RF-Parameters-v1390 OPTIONAL, nonCriticalExtension UE-EUTRA-Capability-v13e0a-IEs OPTIONAL } nsion OCTET STRING (CONTAINING UE-EUTRA-Capability-v13e0b-IEs) OPTIONAL, UE-EUTRA-Capability-v13e0a-IEs ::= SEQUENCE { lateNonCriticalExtension nonCriticalExtension UE-EUTRA-Capability-v1470-IEs OPTIONAL } UE-EUTRA-Capability-v13e0b-IEs ::= SEQUENCE { phyLayerParameters-v13e0 PhyLayerParameters-v13e0, -- Following field is only to be used for late REL-13 extensions nonCriticalExtension SEQUENCE { } OPTIONAL } UE-EUTRA-Capability-v1470-IEs ::= SEQUENCE { mbms-Parameters-v1470 MBMS-Parameters-v1470 phyLayerParameters-v1470 PhyLayerParameters-v14 OPTIONAL, PhyLayerParameters-v1470 OPTIONAL, phyLayerParameters-v1470 RF-Parameters-v1470 OPTIONAL, nonCriticalExtension UE-EUTRA-Capability-v14a0-IEs OPTIONAL } UE-EUTRA-Capability-v14a0-IEs ::= SEQUENCE { phyLayerParameters-v14a0 PhyLayerParameters-v14a0, -- Following field is only to be used for late REL-14 extensions nonCriticalExtension UE-EUTRA-Capability-v14b0-IEs OPTIONAL } UE-EUTRA-Capability-v14b0-IEs ::= SEQUENCE { nonCriticalExtension RF-Parameters-v14b0 OPTIONAL, rf-Parameters-v14b0 SEQUENCE {} OPTIONAL } -- Regular non critical extensions UE-EUTRA-Capability-v920-IEs ::= SEQUENCE { PhyLayerParameters-v920, phyLayerParameters-v920 interRAT-ParametersGERAN-v920 interRAT-ParametersUTRA-v920 IRAT-ParametersGERAN-v920, IRAT-ParametersUTRA-v920 OPTIONAL, IRAT-ParametersCDMA2000-1XRTT-v920 OPTIONAL, interRAT-ParametersCDMA2000-v920 deviceType-r9 ENUMERATED {noBenFromBatConsumpOpt} OPTIONAL, csg-ProximityIndicationParameters-r9 CSG-ProximityIndicationParameters-r9, neighCellSI-AcquisitionParameters-r9 NeighCellSI-AcquisitionParameters-r9, son-Parameters-r9 SON-Parameters-r9, nonCriticalExtension UE-EUTRA-Capability-v940-IEs OPTIONAL } UE-EUTRA-Capability-v940-IEs ::= SEQUENCE { lateNonCriticalExtension OCTET STRING (CONTAINING UE-EUTRA-Capability-v9a0-IEs) OPTIONAL, UE-EUTRA-Capability-v1020-IEs nonCriticalExtension OPTTONAL. } UE-EUTRA-Capability-v1020-IEs ::= SEQUENCE { ue-Category-v1020 INTEGER (6..8) phyLayerParameters-v1020 PhyLayerParamet ue-Category-v1020 OPTIONAL, PhyLayerParameters-v1020 OPTIONAL. ri-Parameters-v1020 measParameters-v1020 featureGroupIndRel10-r10 RF-Parameters-v1020 OPTIONAL. MeasParameters-v1020 OPTIONAL, BIT STRING (SIZE (32)) OPTIONAL, interRAT-ParametersCDMA2000-v1020 IRAT-ParametersCDMA2000-1XRTT-v1020 OPTIONAL, ue-BasedNetwPerfMeasParameters-r10 UE-BasedNetwPerfMeasParameters-r10 OPTIONAL, interRAT-ParametersUTRA-TDD-v1020 IRAT-ParametersUTRA-TDD-v1020 OPTIONAL, nonCriticalExtension UE-EUTRA-Capability-v1060-IEs OPTIONAL } UE-EUTRA-Capability-v1060-IEs ::= SEQUENCE { fdd-Add-UE-EUTRA-Capabilities-v1060 UE-EUTRA-CapabilityAddXDD-Mode-v1060 OPTIONAL, OPTIONAL, tdd-Add-UE-EUTRA-Capabilities-v1060 UE-EUTRA-CapabilityAddXDD-Mode-v1060 rf-Parameters-v1060 RF-Parameters-v1060 OPTIONAL, nonCriticalExtension UE-EUTRA-Capability-v1090-IEs OPTIONAL

}		
UE-EUTRA-Capability-v1090-IEs ::= SEQ	UENCE {	
rf-Parameters-v1090	RF-Parameters-v1090	OPTIONAL,
<pre>nonCriticalExtension }</pre>	UE-EUTRA-Capability-v1130-IEs	OPTIONAL
	,	
UE-EUTRA-Capability-v1130-IEs ::= SEQ pdcp-Parameters-v1130	DENCE { PDCP-Parameters-v1130,	
phyLayerParameters-v1130	PhyLayerParameters-v1130	OPTIONAL,
rf-Parameters-v1130	RF-Parameters-v1130,	
measParameters-v1130 interRAT-ParametersCDMA2000-v1130	MeasParameters-v1130, IRAT-ParametersCDMA2000-v1130,	
otherParameters-r11	Other-Parameters-r11,	
	UE-EUTRA-CapabilityAddXDD-Mode-v1130 UE-EUTRA-CapabilityAddXDD-Mode-v1130	OPTIONAL, OPTIONAL,
nonCriticalExtension	UE-EUTRA-Capability-v1170-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v1170-IEs ::= SEQ	QUENCE {	
phyLayerParameters-v1170	PhyLayerParameters-v1170	OPTIONAL,
ue-Category-v1170 nonCriticalExtension	INTEGER (910) UE-EUTRA-Capability-v1180-IEs	OPTIONAL, OPTIONAL
}	2 John Capability VIIO IBS	01110000
IIE EIITEN Copobility w1100 THE		
UE-EUTRA-Capability-v1180-IEs ::= SEQ rf-Parameters-v1180	UENCE { RF-Parameters-v1180	OPTIONAL,
mbms-Parameters-r11	MBMS-Parameters-r11	OPTIONAL,
	UE-EUTRA-CapabilityAddXDD-Mode-v1180 UE-EUTRA-CapabilityAddXDD-Mode-v1180	OPTIONAL, OPTIONAL,
nonCriticalExtension	UE-EUTRA-Capability-v11a0-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v11a0-IEs ::= SEQ	UENCE {	
ue-Category-v11a0	INTEGER (1112)	OPTIONAL,
measParameters-v11a0 nonCriticalExtension	MeasParameters-v11a0 UE-EUTRA-Capability-v1250-IEs	OPTIONAL, OPTIONAL
}		
UE-EUTRA-Capability-v1250-IEs ::= SEQ	QUENCE {	
phyLayerParameters-v1250	PhyLayerParameters-v1250	OPTIONAL,
rf-Parameters-v1250 rlc-Parameters-r12	RF-Parameters-v1250 RLC-Parameters-r12	OPTIONAL, OPTIONAL,
ue-BasedNetwPerfMeasParameters-v125		
ue-CategoryDL-r12	INTEGER (014)	OPTIONAL,
ue-CategoryUL-r12 wlan-IW-Parameters-r12	INTEGER (013) WLAN-IW-Parameters-r12	OPTIONAL, OPTIONAL,
measParameters-v1250	MeasParameters-v1250	OPTIONAL,
dc-Parameters-r12	DC-Parameters-r12 MBMS-Parameters-v1250	OPTIONAL,
mbms-Parameters-v1250 mac-Parameters-r12	MBMS-Parameters-v1250 MAC-Parameters-r12	OPTIONAL, OPTIONAL,
fdd-Add-UE-EUTRA-Capabilities-v1250	UE-EUTRA-CapabilityAddXDD-Mode-v125	) OPTIONAL,
tdd-Add-UE-EUTRA-Capabilities-v1250 sl-Parameters-r12	UE-EUTRA-CapabilityAddXDD-Mode-v1250 SL-Parameters-r12	
		) OPTIONAL,
sl-Parameters-r12	SL-Parameters-r12	) OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES QUENCE {	) OPTIONAL, OPTIONAL, OPTIONAL
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES QUENCE { INTEGER (1516)	O OPTIONAL, OPTIONAL, OPTIONAL OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES QUENCE {	) OPTIONAL, OPTIONAL, OPTIONAL
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension }</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES	O OPTIONAL, OPTIONAL, OPTIONAL OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES	O OPTIONAL, OPTIONAL, OPTIONAL OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES DUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES	O OPTIONAL, OPTIONAL, OPTIONAL OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE {	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE phyLayerParameters-v1280</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE { PhyLayerParameters-v1280	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE {	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE phyLayerParameters-v1280 nonCriticalExtension }</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE { PhyLayerParameters-v1280 UE-EUTRA-Capability-v1310-IES	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE phyLayerParameters-v1280 nonCriticalExtension } UE-EUTRA-Capability-v1310-IEs ::= SEQUE</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE { PhyLayerParameters-v1280 UE-EUTRA-Capability-v1310-IES ENCE {	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE phyLayerParameters-v1280 nonCriticalExtension } UE-EUTRA-Capability-v1310-IEs ::= SEQUE ue-CategoryDL-v1310 ue-CategoryUL-v1310</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE { PhyLayerParameters-v1280 UE-EUTRA-Capability-v1310-IES ENCE { ENUMERATED {n17, m1} ENUMERATED {n14, m1}	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE phyLayerParameters-v1280 nonCriticalExtension } UE-EUTRA-Capability-v1310-IEs ::= SEQUE ue-CategoryDL-v1310 ue-CategoryUL-v1310 pdcp-Parameters-v1310</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE { PhyLayerParameters-v1280 UE-EUTRA-Capability-v1310-IES ENCE { ENUMERATED {n17, m1} ENUMERATED {n14, m1} PDCP-Parameters-v1310,	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
<pre>sl-Parameters-r12 nonCriticalExtension } UE-EUTRA-Capability-v1260-IEs ::= SEQ ue-CategoryDL-v1260 nonCriticalExtension } UE-EUTRA-Capability-v1270-IEs ::= SEQUE rf-Parameters-v1270 nonCriticalExtension } UE-EUTRA-Capability-v1280-IEs ::= SEQUE phyLayerParameters-v1280 nonCriticalExtension } UE-EUTRA-Capability-v1310-IEs ::= SEQUE ue-CategoryDL-v1310 ue-CategoryUL-v1310</pre>	SL-Parameters-r12 UE-EUTRA-Capability-v1260-IES UUENCE { INTEGER (1516) UE-EUTRA-Capability-v1270-IES ENCE { RF-Parameters-v1270 UE-EUTRA-Capability-v1280-IES ENCE { PhyLayerParameters-v1280 UE-EUTRA-Capability-v1310-IES ENCE { ENUMERATED {n17, m1} ENUMERATED {n14, m1}	O OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,

phyLayerParameters-v1310	PhyLayerParameters-v1310	OPTIONAL,
rf-Parameters-v1310	RF-Parameters-v1310	OPTIONAL,
measParameters-v1310	MeasParameters-v1310	OPTIONAL,
dc-Parameters-v1310 sl-Parameters-v1310	DC-Parameters-v1310 SL-Parameters-v1310	OPTIONAL, OPTIONAL,
scptm-Parameters-r13	SCPTM-Parameters-r13	OPTIONAL,
ce-Parameters-r13	CE-Parameters-r13	OPTIONAL,
interRAT-ParametersWLAN-r13	IRAT-ParametersWLAN-r13,	0111011112,
laa-Parameters-r13	LAA-Parameters-r13	OPTIONAL,
lwa-Parameters-r13	LWA-Parameters-r13	OPTIONAL,
wlan-IW-Parameters-v1310	WLAN-IW-Parameters-v1310,	
lwip-Parameters-r13	LWIP-Parameters-r13,	
-	UE-EUTRA-CapabilityAddXDD-Mode-v1310	OPTIONAL,
tdd-Add-UE-EUTRA-Capabilities-v1310 nonCriticalExtension	UE-EUTRA-CapabilityAddXDD-Mode-v1310	OPTIONAL,
	UE-EUTRA-Capability-v1320-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v1320-IEs ::= SEQUE	NCE {	
ce-Parameters-v1320	CE-Parameters-v1320	OPTIONAL,
phyLayerParameters-v1320	PhyLayerParameters-v1320	OPTIONAL,
rf-Parameters-v1320	RF-Parameters-v1320	OPTIONAL,
	UE-EUTRA-CapabilityAddXDD-Mode-v1320	OPTIONAL,
	UE-EUTRA-CapabilityAddXDD-Mode-v1320	OPTIONAL,
nonCriticalExtension	UE-EUTRA-Capability-v1330-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v1330-IEs ::= SEQUE	NCE {	
ue-CategoryDL-v1330	INTEGER (1819)	OPTIONAL,
phyLayerParameters-v1330	PhyLayerParameters-v1330	OPTIONAL,
ue-CE-NeedULGaps-r13	ENUMERATED {true}	OPTIONAL,
nonCriticalExtension	UE-EUTRA-Capability-v1340-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v1340-IEs ::= SEQUE	•	00000000
ue-CategoryUL-v1340 nonCriticalExtension	INTEGER (15) UE-EUTRA-Capability-v1350-IEs	OPTIONAL, OPTIONAL
}	UE-EUIRA-Capability-VISSU-IES	OPTIONAL
J		
UE-EUTRA-Capability-v1350-IEs ::= SEQUE	INCE {	
ue-CategoryDL-v1350	ENUMERATED {oneBis}	OPTIONAL,
ue-CategoryUL-v1350	ENUMERATED {oneBis}	OPTIONAL,
ce-Parameters-v1350	CE-Parameters-v1350,	
nonCriticalExtension	UE-EUTRA-Capability-v1360-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v1360-IEs ::= SEQUE	NCF {	
other-Parameters-v1360	Other-Parameters-v1360	OPTIONAL,
nonCriticalExtension	UE-EUTRA-Capability-v1430-IEs	OPTIONAL
}		
UE-EUTRA-Capability-v1430-IEs ::= SEQUE		
phyLayerParameters-v1430	PhyLayerParameters-v1430,	
ue-CategoryDL-v1430	ENUMERATED {m2}	OPTIONAL,
ue-CategoryUL-v1430 ue-CategoryUL-v1430b	ENUMERATED {n16, n17, n18, n19, n20, m2 ENUMERATED {n21}	<pre>} OPTIONAL, OPTIONAL,</pre>
mac-Parameters-v1430	MAC-Parameters-v1430	OPTIONAL,
measParameters-v1430	MeasParameters-v1430	OPTIONAL,
pdcp-Parameters-v1430	PDCP-Parameters-v1430	OPTIONAL,
rlc-Parameters-v1430	RLC-Parameters-v1430,	
rf-Parameters-v1430	RF-Parameters-v1430	OPTIONAL,
laa-Parameters-v1430	LAA-Parameters-v1430	OPTIONAL,
lwa-Parameters-v1430	LWA-Parameters-v1430	OPTIONAL,
lwip-Parameters-v1430	LWIP-Parameters-v1430	OPTIONAL,
otherParameters-v1430 mmtel-Parameters-r14	Other-Parameters-v1430, MMTEL-Parameters-r14	
mobilityParameters-r14	MobilityParameters-r14	OPTIONAL, OPTIONAL,
ce-Parameters-v1430	CE-Parameters-v1430,	OF FEDERAL,
	UE-EUTRA-CapabilityAddXDD-Mode-v1430	OPTIONAL,
	UE-EUTRA-CapabilityAddXDD-Mode-v1430	OPTIONAL,
mbms-Parameters-v1430	MBMS-Parameters-v1430	OPTIONAL,
sl-Parameters-v1430	SL-Parameters-v1430	OPTIONAL,
ue-BasedNetwPerfMeasParameters-v143		•
highSpeedEnhParameters-r14 nonCriticalExtension	HighSpeedEnhParameters-r14	OPTIONAL,
<pre>nonCriticalExtension }</pre>	UE-EUTRA-Capability-v1440-IEs	OPTIONAL
,		
UE-EUTRA-Capability-v1440-IEs ::= SEQUE	INCE {	

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mac-Parameters-v1440
                                        MAC-Parameters-v1440,
    nonCriticalExtension
                                        UE-EUTRA-Capability-v1450-IEs
                                                                                 OPTIONAL
}
UE-EUTRA-Capability-v1450-IEs ::= SEQUENCE {
   phyLayerParameters-v1450 PhyLayerParameters-v1450
                                                                        OPTIONAL.
                                       RF-Parameters-v1450
OtherParameters-v1450,
    rf-Parameters-v1450
                                                                    OPTIONAL.
    otherParameters-v1450
    ue-CategoryDL-v1450
                                       INTEGER (20)
                                                                        OPTIONAL,
    nonCriticalExtension
                                            UE-EUTRA-Capability-v1460-IES OPTIONAL
}
UE-EUTRA-Capability-v1460-IEs ::= SEQUENCE {
    ue-CategoryDL-v1460
                                  INTEGER (21)
                                                                            OPTIONAL,
    otherParameters-v1460
                                        Other-Parameters-v1460,
   nonCriticalExtension
                                        UE-EUTRA-Capability-v1510-IEs
                                                                            OPTIONAL
}
UE-EUTRA-Capability-v1510-IEs ::= SEQUENCE {
   irat-ParametersNR-r15
                                            IRAT-ParametersNR-r15
                                                                                     OPTIONAL,
    featureSetsEUTRA-r15
                                            FeatureSetsEUTRA-r15
                                                                                    OPTIONAL,
                                                                                    OPTIONAL,
    pdcp-ParametersNR-r15
                                            PDCP-ParametersNR-r15
    fdd-Add-UE-EUTRA-Capabilities-v1510
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1510
                                                                                    OPTIONAL,
    tdd-Add-UE-EUTRA-Capabilities-v1510
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1510
                                                                                    OPTIONAL,
    nonCriticalExtension
                                            UE-EUTRA-Capability-v1520-IEs
                                                                                    OPTTONAL.
}
UE-EUTRA-Capability-v1520-IEs ::= SEQUENCE {
   measParameters-v1520
                                            MeasParameters-v1520.
    nonCriticalExtension
                                            UE-EUTRA-Capability-v1530-IEs OPTIONAL
}
UE-EUTRA-Capability-v1530-IEs ::= SEQUENCE {
   measParameters-v1530
                                            MeasParameters-v1530
                                                                                    OPTIONAL.
                                                                                    OPTIONAL,
    otherParameters-v1530
                                            Other-Parameters-v1530
    neighCellSI-AcquisitionParameters-v1530 NeighCellSI-AcquisitionParameters-v1530 OPTIONAL,
   mac-Parameters-v1530
                                           MAC-Parameters-v1530
                                                                                    OPTIONAL,
    phyLayerParameters-v1530
                                            PhyLaverParameters-v1530
                                                                                    OPTIONAL,
    rf-Parameters-v1530
                                            RF-Parameters-v1530
                                                                                    OPTIONAL,
                                                                                    OPTIONAL,
   pdcp-Parameters-v1530
                                            PDCP-Parameters-v1530
    ue-CategoryDL-v1530
                                            INTEGER (22..26)
                                                                                    OPTIONAL,
    ue-BasedNetwPerfMeasParameters-v1530
                                            UE-BasedNetwPerfMeasParameters-v1530
                                                                                    OPTIONAL.
    rlc-Parameters-v1530
                                            RLC-Parameters-v1530
                                                                                    OPTIONAL,
    sl-Parameters-v1530
                                            SL-Parameters-v1530
                                                                                    OPTIONAL,
    extendedNumberOfDRBs-r15
                                            ENUMERATED {supported}
                                                                                    OPTIONAL,
    reducedCP-Latency-r15
                                            ENUMERATED {supported}
                                                                                    OPTIONAL,
    laa-Parameters-v1530
                                            LAA-Parameters-v1530
                                                                                    OPTIONAL,
    ue-CategoryUL-v1530
                                            INTEGER (22..26)
                                                                                    OPTIONAL,
    fdd-Add-UE-EUTRA-Capabilities-v1530
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1530
                                                                                    OPTIONAL,
    tdd-Add-UE-EUTRA-Capabilities-v1530
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1530
                                                                                    OPTIONAL,
                                            UE-EUTRA-Capability-v1540-IEs
                                                                                    OPTIONAL
   nonCriticalExtension
}
UE-EUTRA-Capability-v1540-IEs ::= SEQUENCE {
   phyLayerParameters-v1540
                                            PhyLayerParameters-v1540
                                                                                    OPTIONAL,
                                            Other-Parameters-v1540,
    otherParameters-v1540
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1540
    fdd-Add-UE-EUTRA-Capabilities-v1540
                                                                                    OPTIONAL,
    tdd-Add-UE-EUTRA-Capabilities-v1540
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1540
                                                                                    OPTIONAL,
    sl-Parameters-v1540
                                            SL-Parameters-v1540
                                                                                     OPTIONAL.
    irat-ParametersNR-v1540
                                            TRAT-ParametersNR-v1540
                                                                                    OPTTONAL.
                                            UE-EUTRA-Capability-v1550-IEs
   nonCriticalExtension
                                                                                    OPTIONAL
}
UE-EUTRA-Capability-v1550-IEs ::= SEQUENCE {
    neighCellSI-AcquisitionParameters-v1550 NeighCellSI-AcquisitionParameters-v1550 OPTIONAL,
    phyLayerParameters-v1550
                                            PhyLayerParameters-v1550,
    mac-Parameters-v1550
                                            MAC-Parameters-v1550,
    fdd-Add-UE-EUTRA-Capabilities-v1550
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1550,
                                            UE-EUTRA-CapabilityAddXDD-Mode-v1550,
    tdd-Add-UE-EUTRA-Capabilities-v1550
    nonCriticalExtension
                                            UE-EUTRA-Capability-v1560-IEs OPTIONAL
}
UE-EUTRA-Capability-v1560-IEs ::= SEQUENCE {
   pdcp-ParametersNR-v1560 PDCP-ParametersNR-v1560,
irat-ParametersNR-v1560 IRAT-ParametersNR-v1560,
    appliedCapabilityFilterCommon-r15
                                          OCTET STRING
                                                                                     OPTIONAL,
    fdd-Add-UE-EUTRA-Capabilities-v1560 UE-EUTRA-CapabilityAddXDD-Mode-v1560,
    tdd-Add-UE-EUTRA-Capabilities-v1560 UE-EUTRA-CapabilityAddXDD-Mode-v1560,
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<pre>nonCriticalExtension }</pre>	UE-EUTRA-Capability-v1570-IEs	OPTIONAL
irat-ParametersNR-v1570 IRAT-Pa	meters-v1570 OPTIONA	AL, FIONAL, OPTIONAL
phyLayerParameters-r9 featureGroupIndicators-r9 featureGroupIndRe19Add-r9 interRAT-ParametersGERAN-r9 interRAT-ParametersUTRA-r9 interRAT-ParametersCDMA2000-r9 neighCellSI-AcquisitionParameters-r9	DENCE { PhyLayerParameters BIT STRING (SIZE (32)) BIT STRING (SIZE (32)) IRAT-ParametersGERAN IRAT-ParametersUTRA-v920 IRAT-ParametersCDMA2000-1XRTT-v920 NeighCellSI-AcquisitionParameters-	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, r9 OPTIONAL,
}		
<pre>UE-EUTRA-CapabilityAddXDD-Mode-v1060 ::=     phyLayerParameters-v1060     featureGroupIndRel10-v1060     interRAT-ParametersCDMA2000-v1060     interRAT-ParametersUTRA-TDD-v1060    ,</pre>	SEQUENCE { PhyLayerParameters-v1020 BIT STRING (SIZE (32)) IRAT-ParametersCDMA2000-1XRTT-v1020 IRAT-ParametersUTRA-TDD-v1020	OPTIONAL, OPTIONAL, O OPTIONAL, OPTIONAL,
<pre>[[ otdoa-PositioningCapabilities-r10 ]] }</pre>	OTDOA-PositioningCapabilities-r10	OPTIONAL
UE-EUTRA-CapabilityAddXDD-Mode-v1130 ::= phyLayerParameters-v1130 measParameters-v1130 otherParameters-r11	SEQUENCE { PhyLayerParameters-v1130 MeasParameters-v1130 Other-Parameters-r11	OPTIONAL, OPTIONAL, OPTIONAL,
}		
UE-EUTRA-CapabilityAddXDD-Mode-v1180 ::= mbms-Parameters-r11 MBM }	SEQUENCE { IS-Parameters-rll	
	-	FIONAL, FIONAL
<pre>UE-EUTRA-CapabilityAddXDD-Mode-v1310 ::=     phyLayerParameters-v1310 Phy }</pre>	SEQUENCE { /LayerParameters-v1310 OP:	FIONAL
	LayerParameters-v1320 OP	FIONAL, FIONAL
UE-EUTRA-CapabilityAddXDD-Mode-v1370 ::= ce-Parameters-v1370 CE- }	SEQUENCE { Parameters-v1370 OP:	FIONAL
UE-EUTRA-CapabilityAddXDD-Mode-v1380 ::= ce-Parameters-v1380 CE- }	SEQUENCE { Parameters-v1380	
		FIONAL, FIONAL
UE-EUTRA-CapabilityAddXDD-Mode-v1510 ::= pdcp-ParametersNR-r15 }	SEQUENCE { PDCP-ParametersNR-r15 OP	FIONAL
<pre>UE-EUTRA-CapabilityAddXDD-Mode-v1530 ::= neighCellSI-AcquisitionParameters-v1530 reducedCP-Latency-r15 ENUMERA }</pre>	NeighCellSI-AcquisitionParameters-	v1530 OPTIONAL, FIONAL
UE-EUTRA-CapabilityAddXDD-Mode-v1540 ::=	SEQUENCE {	

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eutra-5GC-Parameters-r15
                                                  EUTRA-5GC-Parameters-r15
                                                                                    OPTIONAL,
    irat-ParametersNR-v1540
                                                   IRAT-ParametersNR-v1540
                                                                                    OPTIONAL
}
UE-EUTRA-CapabilityAddXDD-Mode-v1550 ::= SEQUENCE {
   neighCellSI-AcquisitionParameters-v1550 NeighCellSI-AcquisitionParameters-v1550 OPTIONAL
}
UE-EUTRA-CapabilityAddXDD-Mode-v1560 ::= SEQUENCE {
    pdcp-ParametersNR-v1560
                                              PDCP-ParametersNR-v1560
}
AccessStratumRelease ::=
                                      ENUMERATED {
                                         rel8, rel9, rel10, rel11, rel12, rel13,
                                          rel14, rel15, ...}
FeatureSetsEUTRA-r15 ::= SEQUENCE {
    featureSetsDL-r15 SEQUENCE (SIZE (1..maxFeatureSets-r15)) OF FeatureSetDL-r15
    OPTIONAL.
    featureSetsDL-PerCC-r15
                                SEQUENCE (SIZE (1..maxPerCC-FeatureSets-r15)) OF FeatureSetDL-PerCC-
      OPTIONAL,
r15
                               SEQUENCE (SIZE (1..maxFeatureSets-r15)) OF FeatureSetUL-r15
    featureSetsUL-r15
    OPTIONAL,
    featureSetsUL-PerCC-r15 SEQUENCE (SIZE (1..maxPerCC-FeatureSets-r15)) OF FeatureSetUL-PerCC-
r15
        OPTIONAL.
    [[ featureSetsDL-v1550 SEQUENCE (SIZE (1..maxFeatureSets-r15)) OF FeatureSetDL-v1550
    OPTIONAL
    11
}
MobilityParameters-r14 ::=
                                    SEQUENCE {
    makeBeforeBreak-r14
                                          ENUMERATED {supported}
                                                                                   OPTIONAL.
    rach-Less-r14
                                          ENUMERATED {supported}
                                                                                    OPTIONAL
}
DC-Parameters-r12 ::=
drb-TypeSplit-r12
                                SEQUENCE {
                                              ENUMERATED {supported}
                                                                               OPTIONAL.
    drb-TypeSCG-r12
                                              ENUMERATED {supported}
                                                                               OPTIONAL
}
    pdcp-TransferSplitUL-r13
ue-SSTD-Meas r12
DC-Parameters-v1310 ::=
                                              ENUMERATED {supported}
                                                                               OPTIONAL,
    ue-SSTD-Meas-r13
                                              ENUMERATED {supported}
                                                                               OPTIONAL
}
MAC-Parameters-r12 ::=
                                     SEQUENCE {
    logicalChannelSR-ProhibitTimer-r12 ENUMERATED {supported}
                                                                                    OPTIONAL,
                                         ENUMERATED {supported}
    longDRX-Command-r12
                                                                                    OPTIONAL
}
    Parameters-v1310 ::=SEQUENCEextendedMAC-LengthField-r13ENUMERATED {supported}extendedLongDRX-r13ENUMERATED {supported}
MAC-Parameters-v1310 ::=
                                                                           OPTIONAL.
                                                                          OPTIONAL
}
MAC-Parameters-v1430 ::=
                                        SEQUENCE {

    rarameters-v1430
    ..=
    SEQUENCE {

    shortSPS-IntervalFDD-r14
    ENUMERATED {supported}

    shortSPS-IntervalTDD-r14
    ENUMERATED {supported}

                                                                                OPTIONAL,
                                                                               OPTIONAL.
    skipUplinkDynamic-r14
                                         ENUMERATED {supported}
                                                                               OPTIONAL,
    skipUplinkSPS-r14
                                         ENUMERATED {supported}
                                                                                OPTIONAL,
    multipleUplinkSPS-r14
                                         ENUMERATED {supported}
                                                                                OPTIONAL,
    dataInactMon-r14
                                         ENUMERATED {supported}
                                                                               OPTIONAL
}
MAC-Parameters-v1440 ::=
                                         SEOUENCE {
                                    ENUMERATED {supported}
                                                                      OPTIONAL
   rai-Support-r14
}
MAC-Parameters-v1530 ::=
                                SEQUENCE {
    min-Proc-TimelineSubslot-r15 SEQUENCE (SIZE(1..3)) OF ProcessingTimelineSet-r15 OPTIONAL,
    skipSubframeProcessing-r15 SkipSubframeProcessing-r15
                                                                                             OPTIONAL,
    earlyData-UP-r15
                                         ENUMERATED {supported}
                                                                                             OPTIONAL,
    dormantSCellState-r15
                                         ENUMERATED {supported}
                                                                                             OPTIONAL,

    directSCellActivation-r15
    ENUMERATED {supported}

    directSCellHibernation-r15
    ENUMERATED {supported}

                                                                                             OPTIONAL,
                                                                                             OPTIONAL,
    extendedLCID-Duplication-r15 ENUMERATED {supported}
                                                                                             OPTIONAL,
```

```
sps-ServingCell-r15
                                          ENUMERATED {supported}
                                                                                                   OPTIONAL
}
MAC-Parameters-v1550 ::=
                                            SEQUENCE {
    eLCID-Support-r15
                                             ENUMERATED {supported}
                                                                              OPTIONAL
}
ProcessingTimelineSet-r15 ::= ENUMERATED {set1, set2}
RLC-Parameters-r12 ::=
                                       SEQUENCE {
   extended-RLC-LI-Field-r12
                                          ENUMERATED {supported}
}
RLC-Parameters-v1310 ::=
                                           SEQUENCE {
   extendedRLC-SN-SO-Field-r13
                                               ENUMERATED {supported}
                                                                                        OPTIONAL
}
   C-Parameters-v1430 ::= SEQUENCE {
extendedPollByte-r14
ENT
RLC-Parameters-v1430 ::=
                                              ENUMERATED {supported} OPTIONAL
}
RLC-Parameters-v1530 ::= SEQUENCE {
flexibleUM-AM-Combinations-r15 ENUMERATED {supported} OPTIONAL,
rlc-AM-Ooo-Delivery-r15 ENUMERATED {supported} OPTIONAL,
rlc-UM-Ooo-Delivery-r15 ENUMERATED {supported} OPTIONAL
}
PDCP-Parameters ::=
   CP-Parameters ::= SEQUENCE {
supportedROHC-Profiles ROHC-ProfileSupportList-r15,
maxNumberROHC-ContextSessions ENUMERATED {
                                                 cs2, cs4, cs8, cs12, cs16, cs24, cs32,
                                                 cs48, cs64, cs128, cs256, cs512, cs1024,
                                                                                              DEFAULT cs16,
                                                 cs16384, spare2, spare1}
}
PDCP-Parameters-v1130 ::= SEQUENCE {
    pdcp-SN-Extension-r11ENUMERATED {supported}OPTIONAL,supportRohcContextContinue-r11ENUMERATED {supported}OPTIONAL
   pdcp-SN-Extension-r11
}
  CP-Parameters-v1310 ::= SEQUENCE {
pdcp-SN-Extension-18bits-r13 ENUMERA
PDCP-Parameters-v1310 ::=
                                           ENUMERATED {supported} OPTIONAL
}
PDCP-Parameters-v1430 ::=
                                            SEQUENCE {
   supportedUplinkOnlyROHC-Profiles-r14 SEQUENCE {
    profile0x0006-r14 BOOLEAN
      profile0x0006-r14
    maxNumberROHC-ContextSessions-r14
                                               ENUMERATED {
                                                 cs2, cs4, cs8, cs12, cs16, cs24, cs32,
                                                 cs48, cs64, cs128, cs256, cs512, cs1024,
                                                 cs16384, spare2, spare1}
                                                                                              DEFAULT cs16
}
PDCP-Parameters-v1530 ::=
                                    SEQUENCE {
                                        SupportedUDC-r15
    pdcp-Duplication-r15
                                                                               OPTIONAL,
                                            ENUMERATED {supported}
                                                                         OPTIONAL
}
SupportedUDC-r15 ::=
                                        SEQUENCE {
    supportedStandardDic-r15
supportedOperatorDic-r15
                                        ENUMERATED {supported}
                                                                           OPTIONAL,
                                            SupportedOperatorDic-r15
                                                                           OPTIONAL
}
SupportedOperatorDic-r15 ::= SEQUENCE {
versionOfDictionary-r15 INTEGEN
associatedPLMN-ID-r15 PLMN-IC
                                      INTEGER (0..15),
    associatedPLMN-ID-r15
                                            PLMN-Identity
}
PhyLaverParameters ::=
                                       SEOUENCE {
    ue-TxAntennaSelectionSupported
                                         BOOLEAN,
    ue-SpecificRefSigsSupported
                                        BOOLEAN
}
PhyLayerParameters-v920 ::=SEQUENCE {enhancedDualLayerFDD-r9ENUMERATED {supported}enhancedDualLayerTDD-r9ENUMERATED {supported}
                                                                            OPTIONAL.
                                                                           OPTIONAL
```

}

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PhyLayerParameters-v9d0 ::= SEQUENCE { tm5-FDD-r9 ENUMERATED {supported} OPTIONAL. tm5-TDD-r9 ENUMERATED {supported} OPTIONAL } SEQUENCE { PhyLayerParameters-v1020 ::= twoAntennaPortsForPUCCH-r10 ENUMERATED {supported} OPTIONAL, tm9-With-8Tx-FDD-r10 ENUMERATED {supported} OPTIONAL, pmi-Disabling-r10 ENUMERATED {supported} OPTIONAL, crossCarrierScheduling-r10 simultaneousPUCCH-PUSCH-r10 ENUMERATED {supported} OPTTONAL. OPTIONAL, ENUMERATED {supported} multiClusterPUSCH-WithinCC-r10 ENUMERATED {supported} OPTIONAL, nonContiguousUL-RA-WithinCC-List-r10 NonContiguousUL-RA-WithinCC-List-r10 OPTIONAL } PhyLayerParameters-v1130 ::= SEQUENCE { ENUMERATED {supported} crs-InterfHandl-r11 OPTIONAL. ePDCCH-r11 ENUMERATED {supported} OPTIONAL, multiACK-CSI-Reporting-r11 ENUMERATED {supported} OPTIONAL, ss-CCH-InterfHandl-r11 OPTIONAL, ENUMERATED {supported} tdd-SpecialSubframe-r11 ENUMERATED {supported} OPTIONAL, txDiv-PUCCH1b-ChSelect-r11 ENUMERATED {supported} OPTIONAL, ul-CoMP-r11 ENUMERATED {supported} OPTTONAL. } PhyLayerParameters-v1170 ::= SEQUENCE { interBandTDD-CA-WithDifferentConfig-rll BIT STRING (SIZE (2)) OPTIONAL } PhyLayerParameters-v1250 ::= e-HARQ-Pattern-FDD-r12 enhanced-4TxCodebook-r12 SEQUENCE { ENUMERATED {supported} ENUMERATED {supported} OPTIONAL, tdd-FDD-CA-PCellDuplex-r12 phy-TDD-ReConfig-TDD_RC OPTIONAL. BIT STRING (SIZE (2)) tdd-FDD-CA-PCellDuplex-r12 phy-TDD-ReConfig-TDD-PCell-r12 phy-TDD-ReConfig-FDD-PCell-r12 OPTIONAL, ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, pusch-FeedbackMode-r12 ENUMERATED {supported} pusch-SRS-PowerControl-SubframeSet-r12 ENUMERATED {supported} OPTIONAL, OPTIONAL, csi-SubframeSet-r12 ENUMERATED {supported} OPTIONAL, noResourceRestrictionForTTIBundling-r12ENUMERATED {supported}discoverySignalsInDeactSCell-r12ENUMERATED {supported}naics-Capability-List-r12NAICS-Capability-List-r12 OPTIONAL. OPTIONAL. OPTIONAL } PhyLayerParameters-v1280 ::= LayerParameters-v1280 ::= alternativeTBS-Indices-r12 SEQUENCE { ENUMERATED {supported} OPTTONAL. } ayerParameters-v1310 ::= aperiodicCSI-Reporting-r13 PhyLayerParameters-v1310 ::= SEQUENCE { BIT STRING (SIZE (2)) OPTIONAL, BIT STRING (SIZE (2)) codebook-HARQ-ACK-r13 OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, crossCarrierScheduling-B5C-r13 ENUMERATED {supported} ENUMERATED {supported} fdd-HARQ-TimingTDD-r13 idd-HARQ-TimingTDD-r13 maxNumberUpdatedCSI-Proc-r13 INTEGER(5..32) ENUMERATED {supported} pucch-Format4-r13 OPTIONAL, pucch-Format5-r13 ENUMERATED {supported} OPTIONAL, 
 pucch-SCell-r13
 ENUMERATED {supported}

 spatialBundling-HARQ-ACK-r13
 ENUMERATED {supported}

 supportedBlindDecoding-r13
 SEQUENCE {

 maxNumberDecoding-r13
 INTEGER(1..32)

 pdcch-CandidateReductions-r13
 ENUMERATED {supported}

 skipMonitoringDCI-Format0-1A-r13
 ENUMERATED {supported}
 OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL OPTIONAL. uci-PUSCH-Ext-r13 ENUMERATED {supported} OPTIONAL, crs-InterfMitigationTM10-r13ENUMERATED {supported}pdsch-CollisionHandling-r13ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL } PhyLayerParameters-v1320 ::= SEQUENCE { MIMO-UE-Parameters-r13 mimo-UE-Parameters-r13 OPTIONAL } PhyLayerParameters-v1330 ::= SEQUENCE { cch-InterfMitigation-RefRecTypeA-r13 ENUMERATED {supported} cch-InterfMitigation-RefRecTypeB-r13 ENUMERATED {supported} OPTIONAL, OPTIONAL, cch-InterfMitigation-MaxNumCCs-r13 INTEGER (1.. maxServCell-r13) OPTIONAL crs-InterfMitigationTM1toTM9-r13 INTEGER (1.. maxServCell-r13) OPTIONAL OPTIONAL,

}		
PhyLayerParameters-v13e0 ::= mimo-UE-Parameters-v13e0 }	SEQUENCE { MIMO-UE-Parameters-v13e0	
<pre>PhyLayerParameters-v1430 ::= ce-PUSCH-NB-MaxTBS-r14 ce-PDSCH-PUSCH-MaxBandwidth-r14 ce-PDSCH-TenProcesses-r14 ce-PDSCH-TenProcesses-r14 ce-PDSCH-PUSCH-Enhancement-r14 ce-SchedulingEnhancement-r14 ce-SChedulingEnhancement-r14 ce-SRS-Enhancement-r14 ce-ClosedLoopTxAntennaSelection-r14 tdd-SpecialSubframe-r14 tdd-TTI-Bundling-r14 dmrs-LessUpPTS-r14 mimo-UE-Parameters-v1430 alternativeTBS-Index-r14 feMBMS-Unicast-Parameters-r14 }</pre>	SEQUENCE { ENUMERATED {supported} ENUMERATED {bw5, bw20} ENUMERATED {supported} ENUMERATED {supported} FeMBMS-Unicast-Parameters-r14	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
PhyLayerParameters-v1450 ::= ce-SRS-EnhancementWithoutComb4-r14 crs-LessDwPTS-r14	SEQUENCE { ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL}
<pre>PhyLayerParameters-v1470 ::=    mimo-UE-Parameters-v1470    srs-UpPTS-6sym-r14 }</pre>	SEQUENCE { MIMO-UE-Parameters-v1470 ENUMERATED {supported}	OPTIONAL, OPTIONAL
PhyLayerParameters-v14a0 ::= ssp10-TDD-Only-r14 }	SEQUENCE { ENUMERATED {supported}	OPTIONAL
<pre>PhyLayerParameters-v1530 ::= stti-SPT-Capabilities-r15 aperiodicCsi-ReportingSTTI-r15 dmrs-BasedSPDCCH-MBSFN-r15 dmrs-PositionPattern-r15 dmrs-SharingSubslotPDSCH-r15 dmrs-RepetitionSubslotPDSCH-r15 epdcch-SPT-differentCells-r15 epdcch-SPT-differentCells-r15 maxLayersSlotOrSubslotPUSCH-r15 OPTIONAL, maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C maxNumberUpdatedCSI-Proc-STTI-C slotPSCH-TS specyclicShift-r15 sps-STTI-r15 OPTIONAL, tm8-slotPDSCH-r15 tm9-slotSubslotMBSFN-r15 tm0-slotSubslotMBSFN-r15 tm0-slotSubslotMBSFN-r15 txDiv-SPUCCH-r15 ul-AsyncHarqSharingDiff-TTI-Len</pre>	ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {oneLayer,twoLay 5 INTEGER(532) omb77-r15 INTEGER(132) omb27-r15 INTEGER(132) omb22-Set1-r15 INTEGER(132) omb22-Set2-r15 INTEGER(132) MIMO-UE-Parameters-r13 MIMO-UE-Parameters-r13 MIMO-UE-Parameters-v1430 INTEGER(432) -r15 ENUMERATED {supported} ENUMERATED {supported} {supporte	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, SlotAndSubslot} OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
}		OPTIONAL,
ce-Capabilities-r15	SEQUENCE {	

}

}

}

}

}

}

}

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ce-CRS-IntfMitig-r15 ENUMERATED {supported} OPTIONAL, ce-CQI-AlternativeTable-r15 ENUMERATED {supported} OPTIONAL, ce-PDSCH-FlexibleStartPRB-CE-ModeA-r15 ENUMERATED {supported} OPTIONAL, ce-PDSCH-FlexibleStartPRB-CE-ModeB-r15 ENUMERATED {supported} OPTIONAL, ce-PDSCH-640AM-r15 ENUMERATED {supported} OPTIONAL, OPTIONAL, ce-PUSCH-FlexibleStartPRB-CE-ModeA-r15 ENUMERATED {supported} ce-PUSCH-FlexibleStartPRB-CE-ModeB-r15 ENUMERATED {supported} OPTIONAL. OPTIONAL, ce-PUSCH-SubPRB-Allocation-r15 ENUMERATED {supported} ce-UL-HARQ-ACK-Feedback-r15 ENUMERATED {supported} OPTIONAL OPTIONAL, shortCQI-ForSCellActivation-r15 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} ENUMERATED {supported} mimo-CBSR-AdvancedCSI-r15 OPTIONAL. crs-IntfMitig-r15 OPTIONAL. ENUMERATED {supported} ul-PowerControlEnhancements-r15 OPTIONAL, urllc-Capabilities-r15 SEQUENCE { ENUMERATED {supported} pdsch-RepSubframe-r15 OPTIONAL, pdsch-RepSlot-r15 ENUMERATED {supported} OPTIONAL, pdsch-RepSubslot-r15 ENUMERATED {supported} OPTIONAL. pusch-SPS-MultiConfigSubframe-r15 INTEGER (0..6) OPTIONAL. pusch-SPS-MaxConfigSubframe-r15 INTEGER (0..31) OPTIONAL, INTEGER (0..6) pusch-SPS-MultiConfigSlot-r15 OPTIONAL, OPTIONAL, pusch-SPS-MaxConfigSlot-r15 INTEGER (0..31) pusch-SPS-MultiConfigSubslot-r15 INTEGER (0..6) OPTIONAL, pusch-SPS-MaxConfigSubslot-r15 INTEGER (0..31) OPTIONAL, ENUMERATED {supported} pusch-SPS-SlotRepPCell-r15 OPTIONAL. pusch-SPS-SlotRepPSCell-r15 ENUMERATED {supported} OPTIONAL, pusch-SPS-SlotRepSCell-r15 ENUMERATED {supported} OPTIONAL, pusch-SPS-SubframeRepPCell-r15 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} pusch-SPS-SubframeRepPSCell-r15 OPTIONAL, ENUMERATED {supported} pusch-SPS-SubframeRepSCell-r15 OPTIONAL, pusch-SPS-SubslotRepPCell-r15 ENUMERATED {supported} OPTIONAL. pusch-SPS-SubslotRepPSCell-r15 ENUMERATED {supported} OPTIONAL, pusch-SPS-SubslotRepSCell-r15 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL. semiStaticCFI-r15 semiStaticCFI-Pattern-r15 ENUMERATED {supported} OPTIONAL OPTIONAL, altMCS-Table-r15 ENUMERATED {supported} OPTIONAL PhyLayerParameters-v1540 ::= SEQUENCE { stti-SPT-Capabilities-v1540 SEQUENCE { ENUMERATED {supported} slotPDSCH-TxDiv-TM8-r15 OPTIONAL, crs-IM-TM1-toTM9-OneRX-Port-v1540 ENUMERATED {supported} OPTIONAL, cch-IM-RefRecTypeA-OneRX-Port-v1540 ENUMERATED {supported} OPTIONAL PhyLaverParameters-v1550 ::= SEQUENCE { dmrs-OverheadReduction-r15 ENUMERATED {supported} OPTIONAL MIMO-UE-Parameters-r13 ::= SEQUENCE { parametersTM9-r13 MIMO-UE-ParametersPerTM-r13 OPTIONAL, parametersTM10-r13 MIMO-UE-ParametersPerTM-r13 OPTIONAL. srs-EnhancementsTDD-r13 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} ENUMERATED {supported} OPTIONAL, srs-Enhancements-r13 interferenceMeasRestriction-r13 OPTIONAL MIMO-UE-Parameters-v13e0 ::= SEQUENCE { MIMO-WeightedLayersCapabilities-r13 OPTIONAL mimo-WeightedLayersCapabilities-r13 SEQUENCE { MIMO-UE-Parameters-v1430 ::= parametersTM9-v1430 OPTTONAL. MIMO-UE-ParametersPerTM-v1430 parametersTM10-v1430 MIMO-UE-ParametersPerTM-v1430 OPTIONAL SEQUENCE { MIMO-UE-Parameters-v1470 ::= parametersTM9-v1470 MIMO-UE-ParametersPerTM-v1470, parametersTM10-v1470 MIMO-UE-ParametersPerTM-v1470 MIMO-UE-ParametersPerTM-r13 ::= SEQUENCE { nonPrecoded-r13 MIMO-NonPrecodedCapabilities-r13 OPTIONAL, beamformed-r13 MIMO-UE-BeamformedCapabilities-r13 OPTIONAL, ENUMERATED {supported} channelMeasRestriction-r13 OPTIONAL, ENUMERATED {supported} dmrs-Enhancements-r13 OPTIONAL,

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csi-RS-EnhancementsTDD-r13 ENUMERATED {supported} OPTIONAL
}
MIMO-UE-ParametersPerTM-v1430 ::= SEQUENCE {
nzp-CSI-RS-AperiodicInfo-r14 SEQUENC
nMaxProc-r14 IN
                                       SEQUENCE {
                                             INTEGER(5..32),
                                                ENUMERATED {ffs1, ffs2, ffs3, ffs4}
       nMaxResource-r14
                                                                                  OPTIONAL,
    nzp-CSI-RS-PeriodicInfo-r14 SEQUENCE {
        nMaxResource-r14
                                              ENUMERATED {ffs1, ffs2, ffs3, ffs4}
                                      ENUMERATED {support
ENUMERATED {supported}
ENUMERATED {supported}
ENUMERATED {supported}
                                                                                 OPTIONAL.
    ENUMERATED {supported}
                                                                                 OPTIONAL,
                                                                                 OPTIONAL,
    densityReductionNP-r14
                                                                                 OPTIONAL,
    densityReductionBF-r14
                                                                                 OPTIONAL,
                                           ENUMERATED {supported}
    hybridCSI-r14
                                                                                 OPTIONAL,
                                            ENUMERATED {supported}
                                                                                OPTIONAL,
    semiOL-r14
                                             ENUMERATED {supported}
    csi-ReportingNP-r14
                                                                                 OPTIONAL,
    csi-ReportingAdvanced-r14
                                           ENUMERATED {supported}
                                                                                OPTIONAL
}
MIMO-UE-ParametersPerTM-v1470 ::= SEQUENCE {
csi-ReportingAdvancedMaxPorts-r14 ENUMERATED {n8, n12, n16, n20, n24, n28} OPTIONAL
}
MIMO-CA-ParametersPerBoBC-r13 ::=
                                       SEQUENCE {
   parametersTM9-r13
                                           MIMO-CA-ParametersPerBoBCPerTM-r13
                                                                                   OPTIONAL,
    parametersTM10-r13
                                             MIMO-CA-ParametersPerBoBCPerTM-r13
                                                                                     OPTIONAL
}
MIMO-CA-ParametersPerBoBC-r15 ::=
                                       SEQUENCE {
   parametersTM9-r15
                                           MIMO-CA-ParametersPerBoBCPerTM-r15 OPTIONAL,
    parametersTM10-r15
                                             MIMO-CA-ParametersPerBoBCPerTM-r15 OPTIONAL
}
MIMO-CA-ParametersPerBoBC-v1430 ::= SEQUENCE {
   parametersTM9-v1430
                                          MIMO-CA-ParametersPerBoBCPerTM-v1430 OPTIONAL,
    parametersTM10-v1430
                                                                                     OPTIONAL
                                            MIMO-CA-ParametersPerBoBCPerTM-v1430
}
MIMO-CA-ParametersPerBoBC-v1470 ::= SEQUENCE {
                                        MIMO-CA-ParametersPerBoBCPerTM-v1470,
   parametersTM9-v1470
    parametersTM10-v1470
                                                MIMO-CA-ParametersPerBoBCPerTM-v1470
}
MIMO-CA-ParametersPerBoBCPerTM-r13 ::= SEQUENCE {
                                            MIMO-NonPrecodedCapabilities-r13
   nonPrecoded-r13
                                                                                 OPTIONAL,
    beamformed-r13
                                             MIMO-BeamformedCapabilityList-r13 OPTIONAL,
    dmrs-Enhancements-r13
                                             ENUMERATED {different}
                                                                                  OPTIONAL
}
MIMO-CA-ParametersPerBoBCPerTM-v1430 ::= SEQUENCE {
csi-ReportingNP-r14 ENUMERATED {different} OPTIONAL,
csi-ReportingAdvanced-r14 ENUMERATED {different} OPTIONAL
}
MIMO-CA-ParametersPerBoBCPerTM-v1470 ::= SEQUENCE {
csi-ReportingAdvancedMaxPorts-r14 ENUMERATED {n8, n12, n16, n20, n24, n28} OPTIONAL
}
MIMO-CA-ParametersPerBoBCPerTM-r15 ::= SEQUENCE {
                                            MIMO-NonPrecodedCapabilities-r13
    nonPrecoded-r13
                                                                                 OPTIONAL,
                                            MIMO-BeamformedCapabilityList-r13 OPTIONAL,
    beamformed-r13
    dmrs-Enhancements-r13
                                            ENUMERATED {different} OPTIONAL,
ENUMERATED {different} OPTIONAL
    csi-ReportingNP-r14
                                            ENUMERATED {different}
                                                                                 OPTIONAL.
    csi-ReportingAdvanced-r14
                                            ENUMERATED {different}
                                                                                 OPTIONAL
}
MIMO-NonPrecodedCapabilities-r13 ::= SEQUENCE {
                                                                      OPTIONAL,
OPTIONAL,
   config1-r13
                                             ENUMERATED {supported}
                                             ENUMERATED {supported}
    config2-r13
                                             ENUMERATED {supported}
ENUMERATED {supported}
    config3-r13
                                                                             OPTIONAL,
                                                                             OPTIONAL
    config4-r13
}
                                          SEQUENCE {
MIMO-UE-BeamformedCapabilities-r13 ::=
                                             ENUMERATED {supported}
    altCodebook-r13
                                                                            OPTIONAL.
    mimo-BeamformedCapabilities-r13 MIMO-BeamformedCapabilityList-r13
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}

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MIMO-BeamformedCapabilityList-r13 ::= SEQUENCE (SIZE (1..maxCSI-Proc-r11)) OF MIMO-
BeamformedCapabilities-r13
MIMO-BeamformedCapabilities-r13 ::= SEQUENCE {
                                              INTEGER (1..8),
    k-Max-r13
                                              BIT STRING (SIZE (1..7)) OPTIONAL
    n-MaxList-r13
}
MIMO-WeightedLayersCapabilities-r13 ::=
                                            SEQUENCE {
   relWeightTwoLayers-r13 ENUMERATED {v1, v1dot25, v1dot5, v1dot75, v2, v2dot5, v3, v4}, relWeightFourLayers-r13 ENUMERATED {v1, v1dot25, v1dot5, v1dot75, v2, v2dot5, v3, v4}
    OPTIONAL,
    relWeightEightLayers-r13
                               ENUMERATED {v1, v1dot25, v1dot5, v1dot75, v2, v2dot5, v3, v4}
    OPTIONAL,
    totalWeightedLayers-r13 INTEGER (2..128)
}
NonContiguousUL-RA-WithinCC-List-r10 ::= SEQUENCE (SIZE (1..maxBands)) OF NonContiguousUL-RA-
WithinCC-r10
NonContiguousUL-RA-WithinCC-r10 ::= SEQUENCE {
   nonContiguousUL-RA-WithinCC-Info-r10 ENUMERATED {supported}
                                                                                        OPTIONAL
}
RF-Parameters ::=
                                    SEQUENCE {
    supportedBandListEUTRA
                                         SupportedBandListEUTRA
}
RF-Parameters-v9e0 ::=
                                          SEQUENCE {
   supportedBandListEUTRA-v9e0
                                            SupportedBandListEUTRA-v9e0
                                                                                      OPTIONAL
}
RF-Parameters-v1020 ::=
                                    SEQUENCE {
    supportedBandCombination-r10
                                      SupportedBandCombination-r10
}
RF-Parameters-v1060 ::=
                                     SEQUENCE {
    supportedBandCombinationExt-r10
                                           SupportedBandCombinationExt-r10
}
RF-Parameters-v1090 ::=
                                         SEQUENCE {
    supportedBandCombination-v1090
                                             SupportedBandCombination-v1090
                                                                                        OPTIONAL
}
RF-Parameters-v10f0 ::=
                                         SEOUENCE {
   modifiedMPR-Behavior-r10
                                                  BIT STRING (SIZE (32))
                                                                                        OPTIONAL
}
RF-Parameters-v10i0 ::=
                                         SEQUENCE {
    supportedBandCombination-v10i0
                                            SupportedBandCombination-v10i0
                                                                                       OPTIONAL
}
RF-Parameters-v10j0 ::=
                                          SEQUENCE {
   multiNS-Pmax-r10
                                             ENUMERATED {supported}
                                                                                        OPTIONAL
}
RF-Parameters-v1130 ::=
                                     SEQUENCE {
    supportedBandCombination-v1130 SupportedBandCombination-v1130
                                                                                      OPTTONAL.
}
                                    SEQUENCE {
RF-Parameters-v1180 ::=
    fregBandRetrieval-r11
                                             ENUMERATED {supported}
                                                                              OPTIONAL,
                                             SEQUENCE (SIZE (1.. maxBands)) OF FreqBandIndicator-r11
    requestedBands-r11
                        OPTIONAL,
    supportedBandCombinationAdd-r11
                                            SupportedBandCombinationAdd-r11
                                                                                  OPTIONAL
}
RF-Parameters-v11d0 ::=
                                          SEQUENCE {
                                             SupportedBandCombinationAdd-v11d0
    supportedBandCombinationAdd-v11d0
                                                                                        OPTIONAL
}
RF-Parameters-v1250 ::=
                                    SEQUENCE {
   supportedBandListEUTRA-v1250SupportedBandListEUTRAsupportedBandCombination-v1250SupportedBandCombinationsupportedBandCombinationAdd-v1250SupportedBandCombinationfreqBandPriorityAdjustment-r12ENUMERATED {supported}
    supportedBandListEUTRA-v1250
                                             SupportedBandListEUTRA-v1250
                                                                                        OPTIONAL,
                                                                                        OPTIONAL,
                                             SupportedBandCombination-v1250
                                             SupportedBandCombinationAdd-v1250
                                                                                        OPTIONAL,
                                                                                        OPTIONAL
```

}		
RF-Parameters-v1270 ::= SEQUENC supportedBandCombination-v1270 supportedBandCombinationAdd-v1270	E { SupportedBandCombination-v1270 SupportedBandCombinationAdd-v1270	OPTIONAL, OPTIONAL
}		01 1 201412
RF-Parameters-v1310 ::= SEQUENC eNB-RequestedParameters-r13 SEQ	e { uence {	
<pre>reducedIntNonContCombRequested-r13 requestedCCsDL-r13 requestedCCSUL-r13 skipFallbackCombRequested-r13 }</pre>	ENUMERATED {true} INTEGER (232) INTEGER (232) ENUMERATED {true}	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL OPTIONAL,
<pre>maximumCCsRetrieval-r13 skipFallbackCombinations-r13 reducedIntNonContComb-r13 supportedBandListEUTRA-v1310 supportedBandCombinationReduced-r13</pre>	ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported} SupportedBandListEUTRA-v1310 SupportedBandCombinationReduced-r13	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
}		
<pre>RF-Parameters-v1320 ::= SEQUENC supportedBandListEUTRA-v1320 supportedBandCombination-v1320 supportedBandCombinationAdd-v1320 supportedBandCombinationReduced-v1320 }</pre>	E { SupportedBandListEUTRA-v1320 SupportedBandCombination-v1320 SupportedBandCombinationAdd-v1320 SupportedBandCombinationReduced-v1320	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
RF-Parameters-v1380 ::= SEQUENC	<b>`</b>	
<pre>supportedBandCombination-v1380 supportedBandCombinationAdd-v1380 supportedBandCombinationReduced-v1380 }</pre>	SupportedBandCombination-v1380 SupportedBandCombinationAdd-v1380 SupportedBandCombinationReduced-v1380	OPTIONAL, OPTIONAL, OPTIONAL
RF-Parameters-v1390 ::= SEQUENC supportedBandCombination-v1390 supportedBandCombinationAdd-v1390 supportedBandCombinationReduced-v1390	E { SupportedBandCombination-v1390 SupportedBandCombinationAdd-v1390 SupportedBandCombinationReduced-v1390	OPTIONAL, OPTIONAL, OPTIONAL
1		
RF-Parameters-v12b0 ::= SEQUENC maxLayersMIMO-Indication-r12 }	E { ENUMERATED {supported}	OPTIONAL
RF-Parameters-v1430 ::= SEQUENC supportedBandCombination-v1430 supportedBandCombinationAdd-v1430 supportedBandCombinationReduced-v1430 eNB-RequestedParameters-v1430 requestedDiffFallbackCombList-r14	<pre>E {    SupportedBandCombination-v1430    SupportedBandCombinationAdd-v1430    SupportedBandCombinationReduced-v1430    SEQUENCE {       BandCombinationList-r14</pre>	OPTIONAL, OPTIONAL, OPTIONAL,
<pre>} diffFallbackCombReport-r14 }</pre>	ENUMERATED {supported}	OPTIONAL, OPTIONAL
RF-Parameters-v1450 ::= SEQUENC supportedBandCombination-v1450 supportedBandCombinationAdd-v1450 supportedBandCombinationReduced-v1450	E { SupportedBandCombination-v1450 SupportedBandCombinationAdd-v1450 SupportedBandCombinationReduced-v1450	OPTIONAL, OPTIONAL, OPTIONAL
}		
RF-Parameters-v1470 ::= SEQUENC supportedBandCombination-v1470 supportedBandCombinationAdd-v1470 supportedBandCombinationReduced-v1470	E { SupportedBandCombination-v1470 SupportedBandCombinationAdd-v1470 SupportedBandCombinationReduced-v1470	OPTIONAL, OPTIONAL, OPTIONAL
}		
RF-Parameters-v14b0 ::= SEQUENC supportedBandCombination-v14b0 supportedBandCombinationAdd-v14b0 supportedBandCombinationReduced-v14b0	E { SupportedBandCombination-v14b0 SupportedBandCombinationAdd-v14b0 SupportedBandCombinationReduced-v14b0	OPTIONAL, OPTIONAL, OPTIONAL
}		
RF-Parameters-v1530 ::= SEQUENC sTTI-SPT-Supported-r15 supportedBandCombination-v1530 supportedBandCombinationAdd-v1530	ENUMERATED {supported} SupportedBandCombination-v1530 SupportedBandCombinationAdd-v1530	OPTIONAL, OPTIONAL, OPTIONAL,
supportedBandCombinationReduced-v1530 powerClass-14dBm-r15	SupportedBandCombinationReduced-v1530 ENUMERATED {supported}	OPTIONAL, OPTIONAL

}

```
RF-Parameters-v1570 ::=
                                                             SEQUENCE {
       dl-1024QAM-ScalingFactor-r15
                                                                                            ENUMERATED {v1, v1dot2, v1dot25},
       dl-1024QAM-ScalingFactor-115 ENOMERATED
dl-1024QAM-TotalWeightedLayers-r15 INTEGER (0..10)
}
SkipSubframeProcessing-r15 ::= SEQUENCE {
       SkipProcessingDL-Slot-r15INTEGER (0..3)skipProcessingUL-Slot-r15INTEGER (0..3)skipProcessingUL-Slot-r15INTEGER (0..2)
                                                                                                                                           OPTIONAL,
                                                                                                                                            OPTIONAL,
                                                                                                                                           OPTIONAL,
       skipProcessingUL-SubSlot-r15
                                                                           INTEGER (0..3)
                                                                                                                                           OPTTONAL
}
SPT-Parameters-r15 ::=
                                                                    SEQUENCE {
                                                                      BIT STRING (SIZE (3))
      frameStructureType-SPT-r15
                                                                                                                                           OPTIONAL,
                                                                             INTEGER (1..32)
       maxNumberCCs-SPT-r15
                                                                                                                                           OPTTONAL
}
STTI-SPT-BandParameters-r15 ::= SEQUENCE {
                                                                                     ENUMERATED {supported}
                                                                                                                                                 OPTIONAL,
       dl-10240AM-Slot-r15
       dl-1024QAM-SubslotTA-1-r15
dl-1024QAM-SubslotTA-2-r15
                                                                                                                                                 OPTIONAL,
                                                                                   ENUMERATED {supported}
                                                                                     ENUMERATED {supported}
                                                                                                                                                   OPTIONAL,
       simultaneousTx-differentTx-duration-r15 ENUMERATED {supported}
                                                                                                                                                 OPTIONAL,
       sTTI-CA-MIMO-ParametersDL-r15CA-MIMO-ParametersDL-r15sTTI-CA-MIMO-ParametersUL-r15CA-MIMO-ParametersUL-r15,
                                                                                                                                                 OPTIONAL.
                                                                                    CA-MIMO-ParametersUL-r15,
       STTI-MIMO-CA-ParametersPerBoBCs-r15 MIMO-CA-ParametersPerBoBCs-r15 MIMO-CA-PARAMETERSPERBOBCS
                                                                                    ENUMERATED {supported} OPTIONAL,
MIMO-CA-ParametersPerBoBC-r13 OPTIONAL,
       sTTI-MIMO-CA-ParametersPerBoBCs-v1530 MIMO-CA-ParametersPerBoBC-v1430 OPTIONAL,
       sTTI-SupportedCombinations-r15STTI-SupportedCombinations-r15OPTIONAL,sTTI-SupportedCSI-Proc-r15ENUMERATED {n1, n3, n4}OPTIONAL,ul-256QAM-Slot-r15ENUMERATED {supported}OPTIONAL,ul-256QAM-Subslot-r15ENUMERATED {supported}OPTIONAL,
}
STTI-SupportedCombinations-r15 ::= SEQUENCE {
       combination-22-r15SEQUENCE {combination-27-r15DL-UL-CCS-r15combination-27-r15DL-UL-CCS-r15combination-27-r15SEQUENCE (SIZEcombination-77-22-r15SEQUENCE (SIZEcombination-77-27-r15SEQUENCE (SIZE
                                                                                                                                            OPTIONAL,
                                                                                                                                           OPTIONAL,
                                                                                                                                           OPTIONAL,
                                                                            SEQUENCE (SIZE (1..2)) OF DL-UL-CCs-r15
                                                                                                                                                                    OPTIONAL.
                                                                           SEQUENCE (SIZE (1..2)) OF DL-UL-CCS-r15
                                                                                                                                                                    OPTIONAL.
       combination-77-27-r15
                                                                           SEQUENCE (SIZE (1..2)) OF DL-UL-CCs-r15
                                                                                                                                                                   OPTIONAL
}
DL-UL-CCs-r15 ::= SEQUENCE {
       maxNumberDL-CCs-r15
                                                                     INTEGER (1..32)
                                                                                                                                            OPTIONAL.
       maxNumberUL-CCs-r15
                                                                     INTEGER (1..32)
                                                                                                                                            OPTIONAL
}
SupportedBandCombination-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandCombinationParameters-
r10
SupportedBandCombinationExt-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParametersExt-r10
SupportedBandCombination-v1090 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v1090
SupportedBandCombination-v10i0 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v10i0
SupportedBandCombination-v1130 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v1130
SupportedBandCombination-v1250 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v1250
SupportedBandCombination-v1270 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v1270
SupportedBandCombination-v1320 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v1320
SupportedBandCombination-v1380 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF
BandCombinationParameters-v1380
```

SupportedBandCombination-v1390 ::= SEQUENCE (SIZE (1maxBandComb-r10)) OF BandCombinationParameters-v1390
SupportedBandCombination-v1430 ::= SEQUENCE (SIZE (1maxBandComb-r10)) OF BandCombinationParameters-v1430
SupportedBandCombination-v1450 ::= SEQUENCE (SIZE (1maxBandComb-r10)) OF BandCombinationParameters-v1450
SupportedBandCombination-v1470 ::= SEQUENCE (SIZE (1maxBandComb-r10)) OF BandCombinationParameters-v1470
SupportedBandCombination-v14b0 ::= SEQUENCE (SIZE (1maxBandComb-r10)) OF BandCombinationParameters-v14b0
SupportedBandCombination-v1530 ::= SEQUENCE (SIZE (1maxBandComb-r10)) OF BandCombinationParameters-v1530
SupportedBandCombinationAdd-r11 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-r11
SupportedBandCombinationAdd-v11d0 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v10i0
SupportedBandCombinationAdd-v1250 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1250
eq:supportedBandCombinationAdd-v1270 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1270
SupportedBandCombinationAdd-v1320 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1320
SupportedBandCombinationAdd-v1380 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1380
SupportedBandCombinationAdd-v1390 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1390
SupportedBandCombinationAdd-v1430 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1430
SupportedBandCombinationAdd-v1450 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1450
SupportedBandCombinationAdd-v1470 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1470
SupportedBandCombinationAdd-v14b0 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v14b0
SupportedBandCombinationAdd-v1530 ::= SEQUENCE (SIZE (1maxBandComb-r11)) OF BandCombinationParameters-v1530
SupportedBandCombinationReduced-r13 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-r13
SupportedBandCombinationReduced-v1320 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v1320
SupportedBandCombinationReduced-v1380 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v1380
SupportedBandCombinationReduced-v1390 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v1390
SupportedBandCombinationReduced-v1430 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v1430
SupportedBandCombinationReduced-v1450 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v1450
SupportedBandCombinationReduced-v1470 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v1470
SupportedBandCombinationReduced-v14b0 ::= SEQUENCE (SIZE (1maxBandComb-r13)) OF BandCombinationParameters-v14b0

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SupportedBandCombinationReduced-v1530 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF
BandCombinationParameters-v1530
BandCombinationParameters-r10 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-
r10
BandCombinationParametersExt-r10 ::= SEQUENCE {
    supportedBandwidthCombinationSet-r10
                                                SupportedBandwidthCombinationSet-r10 OPTIONAL
}
BandCombinationParameters-v1090 ::= SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-
v1090
BandCombinationParameters-v10i0::= SEQUENCE {
    bandParameterList-v10i0
                                       SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
            BandParameters-v10i0
                                        OPTIONAL
}
BandCombinationParameters-v1130 ::= SEQUENCE {

    multipleTimingAdvance-rll
    ENUMERATED {supported}
    OPTIONAL,

    simultaneousRx-Tx-rll
    ENUMERATED {supported}
    OPTIONAL,

    bandParameterList-rll
    SEQUENCE (SIZE (1..maxSimultaneousBands-rl0)) OF BandParameters-

v1130 OPTIONAL,
    . . .
}
BandCombinationParameters-r11 ::= SEQUENCE {
                                      SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
    bandParameterList-r11
             BandParameters-r11.
    supportedBandwidthCombinationSet-r11
                                                SupportedBandwidthCombinationSet-r10
                                                                                             OPTIONAL.
    multipleTimingAdvance-r11ENUMERATED {supported}simultaneousRx-Tx-r11ENUMERATED {supported}bandInfoEUTRA-r11BandInfoEUTRA,
                                                                                    OPTIONAL,
                                                                                    OPTIONAL,
    bandInfoEUTRA-r11
                                       BandInfoEUTRA,
}
BandCombinationParameters-v1250::= SEQUENCE {
        asynchronous-r12 SEQUENCE {
    dc-Support-r12
                                           ENUMERATED {supported}
                                                                              OPTIONAL,
         asynchronous-r12
supportedCellGrouping-r12
threeEntries-r12
                                           CHOICE {
                 threeEntries-r12
                                                     BIT STRING (SIZE(3)),
                                                     BIT STRING (SIZE(7)),
                  fourEntries-r12
                                                     BIT STRING (SIZE(15))
                 fiveEntries-r12
         }
                                                                                OPTIONAL
                                                                                OPTIONAL,
    supportedNAICS-2CRS-AP-r12BIT STRING (SIZE (1..maxNAICS-Entries-r12))commSupportedBandsPerBC-r12BIT STRING (SIZE (1..maxBands))
                                                                                             OPTIONAL,
                                                                                             OPTTONAL.
}
BandCombinationParameters-v1270 ::= SEQUENCE {
    bandParameterList-v1270 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
            BandParameters-v1270
                                          OPTIONAL
}
BandCombinationParameters-r13 ::= SEQUENCE {
    differentFallbackSupported-r13 ENUMERATED {true}
                                                                           OPTIONAL,
                                      SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF BandParameters-
    bandParameterList-r13
r13,
                                               SupportedBandwidthCombinationSet-r10
    supportedBandwidthCombinationSet-r13
                                                                                             OPTTONAL.
    multipleTimingAdvance-r13 ENUMERATED {supported}
                                                                                OPTIONAL,
    simultaneousRx-Tx-r13
                                        ENUMERATED {supported}
                                                                                OPTIONAL,
    bandInfoEUTRA-r13
                                      BandInfoEUTRA,
                                       SEOUENCE {
    dc-Support-r13
        asynchronous-r13
                                        ENUMERATED {supported}
                                                                                OPTIONAL.
         supportedCellGrouping-r13 CHOICE {
    thus a Future sull?
                 threeEntries-r13
                                                     BIT STRING (SIZE(3)),
                  fourEntries-r13
                                                     BIT STRING (SIZE(7)),
                                                     BIT STRING (SIZE(15))
                 fiveEntries-r13
         }
                                                                                OPTIONAL
                                                                                OPTIONAL
    supportedNAICS-2CRS-AP-r13BIT STRING (SIZE (1..maxNAICS-EntcommSupportedBandsPerBC-r13BIT STRING (SIZE (1.. maxBands))
                                       BIT STRING (SIZE (1..maxNAICS-Entries-r12)) OPTIONAL,
                                                                                    OPTIONAL
}
BandCombinationParameters-v1320 ::= SEQUENCE {
    bandParameterList-v1320 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
            BandParameters-v1320 OPTIONAL,
```

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additionalRx-Tx-PerformanceReq-r13 ENUMERATED {supported}
                                                                                      OPTIONAL
}
BandCombinationParameters-v1380 ::= SEQUENCE {
    bandParameterList-v1380 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
           BandParameters-v1380
                                     OPTIONAL
}
BandCombinationParameters-v1390 ::= SEQUENCE {
    ue-CA-PowerClass-N-r13 ENUMERATED {class2}
                                                                    OPTIONAL
}
           cameterList-v1430 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
BandParameters-v1430 OPTIONAL
BandCombinationParameters-v1430 ::= SEQUENCE {
   bandParameterList-v1430
    v2x-SupportedTxBandCombListPerBC-r14
                                                     BIT STRING (SIZE (1.. maxBandComb-r13))
    OPTTONAL.
    v2x-SupportedRxBandCombListPerBC-r14 BIT STRING (SIZE (1.. maxBandComb-r13))
    OPTIONAL
}
BandCombinationParameters-v1450 ::= SEQUENCE {
   bandParameterList-v1450 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
BandParameters-v1450 OPTIONAL
}
BandCombinationParameters-v1470 ::= SEQUENCE {
   bandParameterList-v1470 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
BandParameters-v1470 OPTIONAL,
    srs-MaxSimultaneousCCs-r14 INTEGER (1..31)
                                                            OPTTONAL.
}
BandCombinationParameters-v14b0 ::= SEQUENCE {
    bandParameterList-v14b0 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
BandParameters-v14b0 OPTIONAL
}
BandCombinationParameters-v1530 ::= SEQUENCE {
bandParameterList-v1530 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF
BandParameters-v1530 OPTIONAL,
   spt-Parameters-r15
                                    SPT-Parameters-r15
                                                                     OPTIONAL
}
-- If an additional band combination parameter is defined, which is supported for MR-DC,
-- it shall be defined in the IE CA-ParametersEUTRA in TS 38.331 [82].
SupportedBandwidthCombinationSet-r10 ::=
                                             BIT STRING (SIZE (1..maxBandwidthCombSet-r10))
BandParameters-r10 ::= SEQUENCE {
    bandEUTRA-r10
                                    FreqBandIndicator,
    bandParametersUL-r10
                                   BandParametersUL-r10
                                                                             OPTIONAL,
    bandParametersDL-r10
                                    BandParametersDL-r10
                                                                              OPTIONAL
}
BandParameters-v1090 ::= SEQUENCE {
   bandEUTRA-v1090
                                     FreqBandIndicator-v9e0
                                                                            OPTIONAL,
}
BandParameters-v10i0::= SEQUENCE {
   bandParametersDL-v10i0 SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersDL-
v10i0
}
BandParameters-v1130 ::= SEQUENCE {
                                    ENUMERATED {n1, n3, n4}
    supportedCSI-Proc-r11
}
BandParameters-r11 ::= SEQUENCE {
    bandParametersUL-r11
                                    FreqBandIndicator-r11,
                                    BandParametersUL-r10
                                                                             OPTIONAL,
    bandParametersDL-r11
                                    BandParametersDL-r10
                                                                             OPTIONAL,
    supportedCSI-Proc-r11
                                    ENUMERATED {n1, n3, n4}
                                                                             OPTIONAL
}
BandParameters-v1270 ::= SEQUENCE {
   bandParametersDL-v1270
                                    SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-
ParametersDL-v1270
}
```

BandParameters-r13 ::= SEQUENCE { FreqBandIndicator-r11, bandEUTRA-r13 bandEUTRA-r13FreqBandIndicator-r11,bandParametersUL-r13BandParametersUL-r13bandParametersDL-r13BandParametersDL-r13supportedCSI-Proc-r13ENUMERATED {n1, n3, n4} OPTIONAL, OPTIONAL, OPTIONAL } BandParameters-v1320 ::= SEQUENCE { bandParametersDL-v1320 MIMO-CA-ParametersPerBoBC-r13 } BandParameters-v1380 ::= SEQUENCE { txAntennaSwitchDL-r13 INTEGER (1..32) txAntennaSwitchUL-r13 INTEGER (1..32) OPTIONAL, OPTIONAL } BandParameters-v1430 ::= SEQUENCE { bandParametersDL-v1430 MIMO-CA-ParametersPerBoBC-v1430 OPTIONAL, ul-256QAM-r14 ENUMERATED {supported} OPTIONAL, ul-256QAM-perCC-InfoList-r14 SEQUENCE (SIZE (2..maxServCell-r13)) OF UL-256QAM-perCC-OPTIONAL, Info-r14 srs-CapabilityPerBandPairList-r14 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF SRS-CapabilityPerBandPair-r14 OPTIONAL } BandParameters-v1450 ::= SEQUENCE { must-CapabilityPerBand-r14 MUST-Parameters-r14 OPTIONAL } BandParameters-v1470 ::= SEQUENCE { MIMO-CA-ParametersPerBoBC-v1470 OPTIONAL bandParametersDL-v1470 } BandParameters-v14b0 ::= SEQUENCE { srs-CapabilityPerBandPairList-v14b0 SEQUENCE (SIZE (1..maxSimultaneousBands-r10)) OF SRS-CapabilityPerBandPair-v14b0 OPTIONAL } BandParameters-v1530 ::= SEQUENCE { ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ue-TxAntennaSelection-SRS-1T4R-r15 ue-TxAntennaSelection-SRS-2T4R-2Pairs-r15 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ue-TxAntennaSelection-SRS-2T4R-3Pairs-r15 dl-1024QAM-r15 qcl-TypeC-Operation-r15 ENUMERATED {supported} OPTIONAL, qcl-CRI-BasedCSI-Reporting-r15 ENUMERATED {supported} OPTIONAL, stti-SPT-BandParameters-r15 STTI-SPT-BandParameters-r15 OPTIONAL } V2X-BandParameters-r14 ::= SEQUENCE { v2x-FreqBandEUTRA-r14FreqBandIndicator-r11,bandParametersTxSL-r14BandParametersTxSL-r14bandParametersRxSL-r14BandParametersRxSL-r14 OPTIONAL, OPTIONAL } V2X-BandParameters-v1530 ::= SEQUENCE {
V2X-BandParameters-v1530 ::= SEQUENCE {
Supported} OPTIONAL } BandParametersTxSL-r14 ::= SEQUENCE { 
 dParameters1xSL-r14
 0.5 Second of the seco v2x-eNB-Scheduled-r14 ENUMERATED {Supported} v2x-eNB-scheduled-r14 ENUMERATED {supported} OPTIONAL, v2x-HighPower-r14 OPTIONAL } 
 IParametersRxSL-r14
 V2X-BandwidthClassSL-r14

 v2x-BandwidthClassRxSL-r14
 V2X-BandwidthClassSL-r14

 v2x-BandwidthClassRxSL-r14
 ENUMERATED {supported}
 BandParametersRxSL-r14 ::= SEQUENCE { V2X-BandwidthClassSL-r14, OPTIONAL } V2X-BandwidthClassSL-r14 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF V2X-BandwidthClass-r14 UL-256QAM-perCC-Info-r14 ::= SEQUENCE { ul-256QAM-perCC-r14 ENUMERATED {supported} OPTIONAL } FeatureSetDL-r15 ::= SEQUENCE { mimo-CA-ParametersPerBoBC-r15 MIMO-CA-ParametersPerBoBC-r15 OPTIONAL,

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featureSetPerCC-ListDL-r15 SEQUENCE (SIZE (1..maxServCell-r13)) OF FeatureSetDL-PerCC-Id-r15
}
FeatureSetDL-v1550 ::= SEQUENCE {
    dl-1024QAM-r15
                                        ENUMERATED {supported}
                                                                                OPTIONAL
}
FeatureSetDL-PerCC-r15 ::= SEQUENCE {
                                                           ENUMERATED {supported}
MO-CapabilityDL-r10
ENUMERATED {n1, n3, n4}
     fourLayerTM3-TM4-r15
                                                                                                          OPTIONAL,
     supportedMIMO-CapabilityDL-MRDC-r15 MIMO-CapabilityDL-r10
supportedCSL-Proc-r15 ENUMERATED {n1 n3
                                                                                                           OPTIONAL,
     supportedCSI-Proc-r15
                                                                                                          OPTIONAL
}
FeatureSetUL-r15 ::= SEQUENCE {
    featureSetPerCC-ListUL-r15 SEQUENCE (SIZE(1..maxServCell-r13)) OF FeatureSetUL-PerCC-Id-r15
}
FeatureSetUL-PerCC-r15 ::= SEQUENCE {
                                                   MIMO-CapabilityUL-r10
    supportedMIMO-CapabilityUL-r15
                                                                                               OPTIONAL.
     ul-256QAM-r15
                                                   ENUMERATED {supported}
                                                                                                OPTIONAL
}
FeatureSetDL-PerCC-Id-r15 ::= INTEGER (0..maxPerCC-FeatureSets-r15)
FeatureSetUL-PerCC-Id-r15 ::= INTEGER (0..maxPerCC-FeatureSets-r15)
BandParametersUL-r10 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersUL-r10
BandParametersUL-r13 ::= CA-MIMO-ParametersUL-r10
CA-MIMO-ParametersUL-r10 ::= SEQUENCE {
                                                  CA-BandwidthClass-r10,
    ca-BandwidthClassUL-r10
     ca-BandwidthClassUL-r10 CA-BandwidthClass-r10,
supportedMIMO-CapabilityUL-r10 MIMO-CapabilityUL-r10
                                                                                         OPTIONAL
}
CA-MIMO-ParametersUL-r15 ::= SEQUENCE {
    supportedMIMO-CapabilityUL-r15
                                                  MIMO-CapabilityUL-r10
                                                                                               OPTIONAL
}
BandParametersDL-r10 ::= SEQUENCE (SIZE (1..maxBandwidthClass-r10)) OF CA-MIMO-ParametersDL-r10
BandParametersDL-r13 ::= CA-MIMO-ParametersDL-r13
CA-MIMO-ParametersDL-r10 ::= SEQUENCE {
    ca-BandwidthClassDL-r10
supportedMIMO-CapabilityDL-r10
                                                   CA-BandwidthClass-r10,
                                                  MIMO-CapabilityDL-r10
                                                                                                OPTIONAL
}
CA-MIMO-ParametersDL-v10i0 ::= SEQUENCE {
    fourLayerTM3-TM4-r10 ENUMERATED {supported}
                                                                                               OPTIONAL
}
CA-MIMO-ParametersDL-v1270 ::= SEQUENCE {
intraBandContiguousCC-InfoList-r12 SEQUENCE (SIZE (1..maxServCell-r10)) OF
}
CA-MIMO-ParametersDL-r13 ::= SEQUENCE {
    ca-BandwidthClassDL-r13 CA-BandwidthClass-r10,
    supportedMIMO-CapabilityDL-r13 MIMO-CapabilityDL-r10 OPTI
    fourLayerTM3-TM4-r13 ENUMERATED {supported}
    fourLayerTM3-TM4-r13 SEQUENCE (SIZE (1..maxServCell-r13)) OF
}
                                                                                                     OPTIONAL,
                                                                                                           OPTIONAL,
}
CA-MIMO-ParametersDL-r15 ::= SEQUENCE {
supportedMIMO-CapabilityDL-r15 MIMO-CapabilityDL-r10 OPT
fourLayerTM3-TM4-r15 ENUMERATED {supported} OPT
intraBandContiguousCC-InfoList-r15 SEQUENCE (SIZE (1..maxServCell-r13)) OF
IntraBandContiguousCC-Info-r12 OPTIONAL
                                                                                                      OPTIONAL,
                                                                                                      OPTIONAL,
}
IntraBandContiguousCC-Info-r12 ::= SEQUENCE {
fourLayerTM3-TM4-perCC-r12 ENUMERATED {supported}
supportedMIMO-CapabilityDL-r12 MIMO-CapabilityDL-r10
supportedCSI-Proc-r12 ENUMERATED {n1, n3, n4}
                                                                                               OPTIONAL,
                                                                                                OPTIONAL,
                                                                                               OPTIONAL
}
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CA-BandwidthClass-r10 ::= ENUMERATED {a, b, c, d, e, f, ...} V2X-BandwidthClass-r14 ::= ENUMERATED {a, b, c, d, e, f, ..., c1-v1530} MIMO-CapabilityUL-r10 ::= ENUMERATED {twoLayers, fourLayers} MIMO-CapabilityDL-r10 ::= ENUMERATED {twoLayers, fourLayers, eightLayers} MUST-Parameters-r14 ::= SEQUENCE { must-TM234-UpTo2Tx-r14 ENUMERATED {supported} OPTIONAL, must IM234 0p1021X 114ENOMERATED {supported}must-TM89-UpToOneInterferingLayer-r14ENUMERATED {supported}must-TM10-UpToOneInterferingLayer-r14ENUMERATED {supported}must-TM89-UpToThreeInterferingLayers-r14ENUMERATED {supported} OPTIONAL, OPTIONAL, OPTIONAL, must-TM10-UpToThreeInterferingLayers-r14 ENUMERATED {supported} OPTIONAL } SupportedBandListEUTRA ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA SupportedBandListEUTRA-v9e0::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v9e0 SupportedBandListEUTRA-v1250 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v1250 SupportedBandListEUTRA-v1310 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v1310 SupportedBandListEUTRA-v1320 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandEUTRA-v1320 SupportedBandEUTRA ::= SEQUENCE { bandEUTRA FreqBandIndicator, halfDuplex BOOLEAN } SupportedBandEUTRA-v9e0 ::= SEQUENCE { bandEUTRA-v9e0 FreqBandIndicator-v9e0 OPTIONAL } SupportedBandEUTRA-v1250 ::= SEQUENCE { dl-256QAM-r12 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL ul-64QAM-r12 ENUMERATED {supported} } SupportedBandEUTRA-v1310 ::= SEQUENCE { ENUMERATED {supported} OPTIONAL SupportedBandEUTRA-v1320 ::= SEQUENCE { intraFreq-CE-NeedForGaps-r13 ENUMERATED {supported} OPTIONAL, ue-PowerClass-N-r13 ENUMERATED {class1, class2, class4} OPTIONAL } MeasParameters ::= SEQUENCE { bandListEUTRA BandListEUTRA } MeasParameters-v1020 ::= SEQUENCE { BandCombinationListEUTRA-r10 bandCombinationListEUTRA-r10 } MeasParameters-v1130 ::= SEOUENCE { rsrqMeasWideband-r11 ENUMERATED {supported} OPTIONAL } MeasParameters-v11a0 ::= SEQUENCE { benefitsFromInterruption-r11 ENUMERATED {true} OPTIONAL } MeasParameters-v1250 ::= SEQUENCE { timerT312-r12 alternativeTimeToTrigger-r12 ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported} OPTIONAL, OPTIONAL, incMonEUTRA-r12 OPTIONAL, ENUMERATED {supported} OPTIONAL, extendedMaxMeasId-r12ENUMERATED {supported}extendedRSRQ-LowerRange-r12ENUMERATED {supported}rsrq-OnAllSymbols-r12ENUMERATED {supported}crs-DiscoverySignalsMeas-r12ENUMERATED {supported} extendedMaxMeasId-r12 OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, csi-RS-DiscoverySignalsMeas-r12 ENUMERATED {supported} OPTIONAL } MeasParameters-v1310 ::= rs-SINR-Meas-r13 SEQUENCE { ENUMERATED {supported} OPTIONAL,

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whiteCellList-r13 ENUMERATED {supported} OPTIONAL, extendedMaxObjectId-r13 ENUMERATED {supported} OPTIONAL, OPTIONAL, ENUMERATED {supported} ul-PDCP-Delay-r13 extendedFreqPriorities-r13 ENUMERATED {supported} OPTIONAL, multiBandInfoReport-r13 ENUMERATED {supported} OPTIONAL, rssi-AndChannelOccupancyReporting-r13 ENUMERATED {supported} OPTIONAL } MeasParameters-v1430 ::= SEQUENCE { ceMeasurements-r14 ENUMERATED {supported} OPTIONAL, OPTIONAL, ncsg-r14 shortMeasurementGap-r14 ENUMERATED {supported} ncsg-r14ENUMERATEDENUMERATEDshortMeasurementGap-r14ENUMERATED{supported}perServingCellMeasurementGap-r14ENUMERATED{supported}nonUniformGap-r14ENUMERATED{supported} OPTIONAL, OPTIONAL, OPTIONAL } MeasParameters-v1520 ::= SEQUENCE { measGapPatterns-r15 BIT STE BIT STRING (SIZE (8)) OPTIONAL } MeasParameters-v1530 ::= SEQUENCE { 
 qoe-MeasReport-r15
 ENUMERATED {supported}
 OPTIONAL,

 qoe-MTSI-MeasReport-r15
 ENUMERATED {supported}
 OPTIONAL,

 ca-IdleModeMeasurements-r15
 ENUMERATED {supported}
 OPTIONAL,

 ca-IdleModeValidityArea-r15
 ENUMERATED {supported}
 OPTIONAL,
 ENUMERATED { supported } OPTIONAL, ENUMERATED { supported } OPTIONAL, ENUMERATED { supported } OPTIONAL OPTIONAL, heightMeas-r15 multipleCellsMeasExtension-r15 ENUMERATED {supported} OPTIONAL } SEQUENCE (SIZE (1..maxBands)) OF BandInfoEUTRA BandListEUTRA ::= BandCombinationListEUTRA-r10 ::= SEQUENCE (SIZE (1..maxBandComb-r10)) OF BandInfoEUTRA BandInfoEUTRA ::= SEOUENCE { interFreqBandList InterFreqBandList, interRAT-BandList InterRAT-BandList OPTIONAL } InterFreqBandList ::= SEQUENCE (SIZE (1..maxBands)) OF InterFreqBandInfo InterFreqBandInfo ::= SEQUENCE { interFreqNeedForGaps BOOLEAN InterRAT-BandList ::= SEQUENCE (SIZE (1..maxBands)) OF InterRAT-BandInfo SEQUENCE { InterRAT-BandInfo ::= interRAT-NeedForGaps BOOLEAN } IRAT-ParametersNR-r15 ::= SEQUENCE { ENUMERATED {supported} OPTIONAL, en-DC-r15 eventB2-r15 ENUMERATED {supported} OPTIONAL, supportedBandListEN-DC-r15 SupportedBandListNR-r15 OPTIONAL } IRAT-ParametersNR-v1540 ::= SEQUENCE { eutra-5GC-HO-TONR-FDD-FR1-r15 ENUMERATED {supported} OPTIONAL, eutra-5GC-HO-TONR-TDD-FR1-r15ENUMERATED{supported}eutra-5GC-HO-TONR-FDD-FR2-r15ENUMERATED{supported}eutra-5GC-HO-TONR-TDD-FR2-r15ENUMERATED{supported}eutra-EPC-HO-TONR-FDD-FR1-r15ENUMERATED{supported} OPTIONAL, OPTIONAL. OPTIONAL, eutra-EPC-HO-ToNR-FDD-FR1-r15 ENUMERATED {supported} OPTIONAL, eutra-EPC-HO-TONR-TDD-FR1-r15 ENUMERATED {supported} OPTIONAL, cutra EPC HOTIONR-TDD-FRITIDENUMERATED {supported}eutra-EPC-HO-TONR-FDD-FR2-r15ENUMERATED {supported}ims-VoiceOverNR-FR1-r15ENUMERATED {supported}ims-VoiceOverNR-FR1-r15ENUMERATED {supported} OPTIONAL. 

 NUMERATED {supported}
 OPTIONAL,

 NUMERATED {supported}
 OPTIONAL,

 NUMERATED {supported}
 OPTIONAL,

 ENUMERATED {supported}
 OPTIONAL

 interported {supported}
 OPTIONAL

 ENUMERATED {supported} ims-VoiceOverNR-FR2-r15 OPTIONAL, sa-NR-r15 supportedBandListNR-SA-r15 SupportedBandListNR-r15 } IRAT-ParametersNR-v1560 ::= SEQUENCE { ng-EN-DC-r15 ENUMERATED {supported} OPTIONAL } IRAT-ParametersNR-v1570 ::= SEQUENCE { ss-SINR-Meas-NR-FR1-r15 ENUMERATED {supported} OPTIONAL. ss-SINR-Meas-NR-FR2-r15 ENUMERATED {supported} OPTIONAL

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EUTRA-5GC-Parameters-r15 ::= SEQUENCE { ENUMERATED {supported} eutra-5GC-r15 OPTIONAL, OPTIONAL, eutra-EPC-HO-EUTRA-5GC-r15 ENUMERATED {supported} ho-EUTRA-5GC-FDD-TDD-r15 ENUMERATED {supported} OPTIONAL, OPTIONAL, ho-EUTRA-5GC-FDD-TDD-r15ENUMERATED (Supported)ho-InterfreqEUTRA-5GC-r15ENUMERATED {supported}ims-VoiceOverMCG-BearerEUTRA-5GC-r15ENUMERATED {supported}inactiveState-r15ENUMERATED {supported}reflectiveQoS-r15ENUMERATED {supported} OPTIONAL, OPTIONAL, OPTIONAL } PDCP-ParametersNR-r15 ::= SEQUENCE { rohc-ContextMaxSessions-r15 ENUMERATED { rohc-Profiles-r15 cs2, cs4, cs8, cs12, cs16, cs24, cs32, cs48, cs64, cs128, cs256, cs512, cs1024, DEFAULT cs16, cs16384, spare2, spare1} rohc-ProfilesUL-Only-r15 SEQUENCE { profile0x0006-r15 BOOLEAN rohc-ContextContinue-r15ENUMERATED {supported}outOfOrderDelivery-r15ENUMERATED {supported}Sn-SizeLo-r15ENUMERATED {supported} OPTIONAL, OPTIONAL, OPTIONAL, sn-SizeLo-r15 ENUMERATED {supported} ims-VoiceOverNR-PDCP-MCG-Bearer-r15 ENUMERATED {supported} OPTIONAL. ims-VoiceOverNR-PDCP-SCG-Bearer-r15 ENUMERATED {supported} OPTIONAL } PDCP-ParametersNR-v1560 ::= SEQUENCE { ENUMERATED {supported} OPTIONAL ims-VoNR-PDCP-SCG-NGENDC-r15 } ROHC-ProfileSupportList-r15 ::= SEQUENCE { profile0x0001-r15 BOOLEAN, profile0x0002-r15 BOOLEAN, profile0x0003-r15 BOOLEAN, profile0x0004-r15 BOOLEAN, profile0x0006-r15 BOOLEAN, profile0x0101-r15 BOOLEAN, profile0x0102-r15 BOOLEAN, profile0x0103-r15 BOOLEAN, profile0x0104-r15 BOOLEAN } SupportedBandListNR-r15 ::= SEQUENCE (SIZE (1..maxBandsNR-r15)) OF SupportedBandNR-r15 SupportedBandNR-r15 ::= SEQUENCE { bandNR-r15 FreqBandIndicatorNR-r15 } MT-ParametersUTRA-FDD ::= SEQUENCE { supportedBandListUTRA-FDD SupportedBandListUTRA-FDD IRAT-ParametersUTRA-FDD ::= } IRAT-ParametersUTRA-v920 ::= SEQUENCE { ENUMERATED {supported} e-RedirectionUTRA-r9 } IRAT-ParametersUTRA-v9c0 ::= SEQUENCE {
 voiceOverPS-HS-UTRA-FDD-r9 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, voiceOverPS-HS-UTRA-TDD128-r9 srvcc-FromUTRA-FDD-ToUTRA-FDD-r9 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported} OPTIONAL, srvcc-FromUTRA-FDD-ToGERAN-r9 srvcc-FromUTRA-TDD128-ToUTRA-TDD128-r9 OPTIONAL, srvcc-FromUTRA-TDD128-ToGERAN-r9 OPTIONAL } IRAT-ParametersUTRA-v9h0 ::= SEQUENCE { mfbi-UTRA-r9 ENUMERATED {supported} } SupportedBandListUTRA-FDD ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-FDD SupportedBandUTRA-FDD ::= ENUMERATED { bandI, bandII, bandIII, bandIV, bandV, bandVI, bandVII, bandVIII, bandIX, bandX, bandXI, bandXII, bandXIII, bandXIV, bandXV, bandXVI, ..., bandXVII-8a0, bandXVIII-8a0, bandXIX-8a0, bandXX-8a0,

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bandXXI-8a0, bandXXII-8a0, bandXXIII-8a0, bandXXIV-8a0,
                                        bandXXV-8a0, bandXXVI-8a0, bandXXVII-8a0, bandXXVIII-8a0,
bandXXIX-8a0, bandXXX-8a0, bandXXXI-8a0, bandXXXII-8a0}
IRAT-ParametersUTRA-TDD128 ::=
                                    SEQUENCE {
   supportedBandListUTRA-TDD128
                                        SupportedBandListUTRA-TDD128
SupportedBandListUTRA-TDD128 ::=
                                    SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD128
SupportedBandUTRA-TDD128 ::=
                                    ENUMERATED {
                                         a, b, c, d, e, f, g, h, i, j, k, l, m, n,
                                         o, p, ...}
IRAT-ParametersUTRA-TDD384 ::=
                                    SEQUENCE {
                                        SupportedBandListUTRA-TDD384
   supportedBandListUTRA-TDD384
SupportedBandListUTRA-TDD384 ::=
                                    SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD384
SupportedBandUTRA-TDD384 ::=
                                    ENUMERATED {
                                            a, b, c, d, e, f, g, h, i, j, k, l, m, n,
                                            o, p, ...}
IRAT-ParametersUTRA-TDD768 ::=
                                    SEQUENCE {
    supportedBandListUTRA-TDD768
                                        SupportedBandListUTRA-TDD768
SupportedBandListUTRA-TDD768 ::=
                                    SEQUENCE (SIZE (1..maxBands)) OF SupportedBandUTRA-TDD768
SupportedBandUTRA-TDD768 ::=
                                    ENUMERATED {
                                        a, b, c, d, e, f, g, h, i, j, k, l, m, n,
                                         o, p, ...}
IRAT-ParametersUTRA-TDD-v1020 ::=
                                         SEQUENCE {
   e-RedirectionUTRA-TDD-r10
                                            ENUMERATED {supported}
}
IRAT-ParametersGERAN ::=
                                    SEQUENCE {
   I-ParametersGERAN ::=
supportedBandListGERAN
                                     SupportedBandListGERAN,
    interRAT-PS-HO-ToGERAN
                                        BOOLEAN
}
IRAT-ParametersGERAN-v920 ::=
                                    SEQUENCE {
                                                                       OPTIONAL,
   dtm-r9
                                         ENUMERATED {supported}
    e-RedirectionGERAN-r9
                                         ENUMERATED {supported}
                                                                         OPTIONAL
}
SupportedBandListGERAN ::=
                                    SEQUENCE (SIZE (1..maxBands)) OF SupportedBandGERAN
                                    ENUMERATED {
SupportedBandGERAN ::=
                                         gsm450, gsm480, gsm710, gsm750, gsm810, gsm850,
                                         gsm900P, gsm900E, gsm900R, gsm1800, gsm1900,
                                         spare5, spare4, spare3, spare2, spare1, ...}
                                    SEQUENCE {
IRAT-ParametersCDMA2000-HRPD ::=
    supportedBandListHRPD
                                        SupportedBandListHRPD,
    tx-ConfigHRPD
                                         ENUMERATED {single, dual},
   rx-ConfigHRPD
                                         ENUMERATED {single, dual}
}
SupportedBandListHRPD ::=
                                    SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandclassCDMA2000
IRAT-ParametersCDMA2000-1XRTT ::=
                                    SEOUENCE {
    supportedBandList1XRTT
                                         SupportedBandList1XRTT,
    tx-Config1XRTT
                                         ENUMERATED {single, dual},
                                         ENUMERATED {single, dual}
   rx-Config1XRTT
}
IRAT-ParametersCDMA2000-1XRTT-v920 ::= SEQUENCE {
    e-CSFB-1XRTT-r9
                                         ENUMERATED {supported},
    e-CSFB-ConcPS-Mob1XRTT-r9
                                        ENUMERATED {supported}
                                                                        OPTIONAL
}
IRAT-ParametersCDMA2000-1XRTT-v1020 ::= SEQUENCE {
   e-CSFB-dual-1XRTT-r10
                                        ENUMERATED {supported}
}
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IRAT-ParametersCDMA2000-v1130 ::= SEQUENCE { cdma2000-NW-Sharing-r11 ENUMERATED {supported} OPTIONAL } SupportedBandList1XRTT ::= SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF BandclassCDMA2000 IRAT-ParametersWLAN-r13 ::= SEQUENCE { supportedBandListWLAN-r13 SEQUEN SEQUENCE (SIZE (1..maxWLAN-Bands-r13)) OF WLAN-BandIndicator-r13 OPTIONAL } CSG-ProximityIndicationParameters-r9 ::= SEQUENCE { intraFreqProximityIndication-r9 ENUMERATED {supported} interFreqProximityIndication-r9 ENUMERATED {supported} utran-ProximityIndication-r9 ENUMERATED {supported} OPTIONAL, OPTIONAL, OPTIONAL } NeighCellSI-AcquisitionParameters-r9 ::= SEQUENCE { intraFreqSI-AcquisitionForHO-r9 ENUMERATED {supported} OPTIONAL, interFreqSI-AcquisitionForHO-r9 ENUMERATED {supported} OPTIONAL, utran-SI-AcquisitionForHO-r9 ENUMERATED {supported} OPTIONAL } NeighCellSI-AcquisitionParameters-v1530 ::= SEQUENCE { ENUMERATED {supported} ENUMERATED {supported} reportCGI-NR-EN-DC-r15 OPTIONAL, reportCGI-NR-NoEN-DC-r15 OPTIONAL } NeighCellSI-AcquisitionParameters-v1550 ::= SEQUENCE { eutra-CGI-Reporting-ENDC-r15ENUMERATED {supported}OPTIONAL,utra-GERAN-CGI-Reporting-ENDC-r15ENUMERATED {supported}OPTIONAL eutra-CGI-Reporting-ENDC-r15 } SON-Parameters-r9 ::= SEQUENCE { rach-Report-r9 ENUMERATED {supported} OPTIONAL } UE-BasedNetwPerfMeasParameters-r10 ::= SEQUENCE { loggedMeasurementsIdle-r10ENUMERATED {supported}OPTIONAL,standaloneGNSS-Location-r10ENUMERATED {supported}OPTIONAL } UE-BasedNetwPerfMeasParameters-v1250 ::= SEQUENCE { loggedMBSFNMeasurements-r12 ENUMERATED {supported} } UE-BasedNetwPerfMeasParameters-v1430 ::= SEQUENCE { locationReport-r14 ENUMERATED {supported} OPTIONAL } UE-BasedNetwPerfMeasParameters-v1530 ::= SEQUENCE { loggedMeasBT-r15 ENUMERATED {supported} OPTIONAL, loggedMeasWLAN-r15 ENUMERATED {supported} OPTIONAL. immMeasBT-r15 ENUMERATED {supported} OPTIONAL, immMeasWLAN-r15 OPTIONAL ENUMERATED {supported} } OTDOA-PositioningCapabilities-r10 ::= SEQUENCE { otaoa-UE-Assisted-r10 ENUMERATED {supported}, interFreqRSTD-Measurement-r10 ENUMERATED {supported} ENUMERATED {supported} OPTIONAL } SEQUENCE { Other-Parameters-r11 ::= 
 ENUMERATED {supported}
 OPTIONAL,

 ENUMERATED {supported}
 OPTIONAL,

 ENUMERATED {supported}
 OPTIONAL
 inDeviceCoexInd-r11 powerPrefInd-r11 ue-Rx-TxTimeDiffMeasurements-r11 } er-Parameters-v11d0 ::= SEQUENCE { inDeviceCoexInd-UL-CA-r11 ENUMER Other-Parameters-v11d0 ::= ENUMERATED {supported} OPTIONAL } Other-Parameters-v1360 ::= SEQUENCE { inDeviceCoexInd-HardwareSharingInd-r13 ENUMERATED {supported} OPTIONAL } Other-Parameters-v1430 ::= SEQUENCE {

bwPrefInd-r14	ENUMERATED {supported}	OPTIONAL,
<pre>rlm-ReportSupport-r14 }</pre>	ENUMERATED {supported}	OPTIONAL
OtherParameters-v1450 ::= SEQUENC overheatingInd-r14 }	E { ENUMERATED {supported}	OPTIONAL
Other-Parameters-v1460 ::= SEQUENC nonCSG-SI-Reporting-r14 }	E { ENUMERATED {supported}	OPTIONAL
Other-Parameters-v1530 ::= assistInfoBitForLC-r15 timeReferenceProvision-r15 flightPathPlan-r15 }	SEQUENCE { ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL, OPTIONAL
Other-Parameters-v1540 ::= inDeviceCoexInd-ENDC-r15 }	SEQUENCE { ENUMERATED {supported}	OPTIONAL
<pre>MBMS-Parameters-r11 ::=    mbms-SCell-r11    mbms-NonServingCell-r11 }</pre>	SEQUENCE { ENUMERATED {support ENUMERATED {support	
<pre>MBMS-Parameters-v1250 ::=    mbms-AsyncDC-r12 }</pre>	SEQUENCE { ENUMERATED {support	ed} OPTIONAL
<pre>MBMS-Parameters-v1430 ::=    fembmsDedicatedCell-r14    fembmsMixedCell-r14    subcarrierSpacingMBMS-khz7dot5-    subcarrierSpacingMBMS-khz1dot25 }</pre>		OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
<pre>MBMS-Parameters-v1470 ::= SEQ mbms-MaxBW-r14 implicitValue explicitValue }, mbms-ScalingFactor1dot25-r14 mbms-ScalingFactor7dot5-r14 }</pre>	UENCE { CHOICE { NULL, INTEGER(220) ENUMERATED {n3, n6, n9, ENUMERATED {n1, n2, n3, n4}	
<pre>FeMBMS-Unicast-Parameters-r14 ::=     unicast-fembmsMixedSCell-r14     emptyUnicastRegion-r14 }</pre>	SEQUENCE { ENUMERATED {support ENUMERATED {support	
<pre>SCPTM-Parameters-r13 ::=     scptm-ParallelReception-r13     scptm-SCell-r13     scptm-NonServingCell-r13     scptm-AsyncDC-r13 }</pre>	ENUMERATED {sup	<pre>ported} OPTIONAL, pported} OPTIONAL, pported} OPTIONAL, pported} OPTIONAL</pre>
CE-Parameters-r13 ::= SEQUENC ce-ModeA-r13 ce-ModeB-r13 }	E { ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL
<pre>CE-Parameters-v1320 ::= SEQUENC intraFreqA3-CE-ModeA-r13 intraFreqA3-CE-ModeB-r13 intraFreqH0-CE-ModeA-r13 intraFreqH0-CE-ModeB-r13 }</pre>	E { ENUMERATED {support ENUMERATED {support ENUMERATED {support ENUMERATED {support	ed} OPTIONAL, ed} OPTIONAL,
CE-Parameters-v1350 ::= SEQUENC unicastFrequencyHopping-r13 }	E { ENUMERATED {support	ed} OPTIONAL
CE-Parameters-v1370 ::= SEQUENC tm9-CE-ModeA-r13 tm9-CE-ModeB-r13	E { ENUMERATED {support ENUMERATED {support	

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}		
CE-Parameters-v1380 ::= SEQ tm6-CE-ModeA-r13 }	UENCE { ENUMERATED {supported}	OPTIONAL
CE-Parameters-v1430 ::= SEQ ce-SwitchWithoutHO-r14 }	UENCE { ENUMERATED {supported}	OPTIONAL
LAA-Parameters-r13 ::=	SEQUENCE {	
<pre>crossCarrierSchedulingLAA-L csi-RS-DRS-RRM-Measurements downlinkLAA-r13 endingDwPTS-r13 secondSlotStartingPosition- tm9-LAA-r13 tm10-LAA-r13 }</pre>	DL-r13 ENUMERATED {supported} DLAA-r13 ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL,
LAA-Parameters-v1430 ::=	SEQUENCE {	
LAA-Parameters-V1430 ::= crossCarrierSchedulingLAA-U uplinkLAA-r14 twoStepSchedulingTimingInfc uss-BlindDecodingAdjustment uss-BlindDecodingReduction- outOfSequenceGrantHandling- }	L-r14 ENUMERATED {supported} ENUMERATED {supported} e-r14 ENUMERATED {nPlus1, nPlus2, r14 ENUMERATED {supported} r14 ENUMERATED {supported}	OPTIONAL, OPTIONAL, nPlus3} OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
LAA-Parameters-v1530 ::=	SEQUENCE {	
<pre>aul-r15 laa-PUSCH-Model-r15 laa-PUSCH-Mode2-r15 laa-PUSCH-Mode3-r15 }</pre>	ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
WLAN-IW-Parameters-r12 ::= SEQ	UENCE {	
<pre>wlan-IW-RAN-Rules-r12 wlan-IW-ANDSF-Policies-r12 }</pre>		FIONAL, OPTIONAL
LWA-Parameters-r13 ::= SEQ lwa-r13 lwa-SplitBearer-r13 wlan-MAC-Address-r13 lwa-BufferSize-r13 }	UENCE { ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, OCTET STRING (SIZE (6)) OPTIONAL, ENUMERATED {supported} OPTIONAL	
<pre>LWA-Parameters-v1430 ::=     lwa-HO-WithoutWT-Change-r14     lwa-UL-r14     wlan-PeriodicMeas-r14     wlan-ReportAnyWLAN-r14     wlan-SupportedDataRate-r14 }</pre>	SEQUENCE { ENUMERATED {supported} OPTIONA ENUMERATED {supported} OPTIONA ENUMERATED {supported} OPTIONA ENUMERATED {supported} OPTIONA INTEGER (12048) OPTIONA	AL, AL, AL,
LWA-Parameters-v1440 ::= lwa-RLC-UM-r14 }	SEQUENCE { ENUMERATED {supported} OPTIONA	AL
WLAN-IW-Parameters-v1310 ::= rclwi-r13 }	SEQUENCE {     ENUMERATED {supported}	OPTIONAL
LWIP-Parameters-r13 ::= SEQ lwip-r13 }	UENCE { ENUMERATED {supported} OPTIONA	AL
LWIP-Parameters-v1430 ::= lwip-Aggregation-DL-r14 lwip-Aggregation-UL-r14 }	SEQUENCE { ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL
NAICS-Capability-List-r12 ::= S r12	EQUENCE (SIZE (1maxNAICS-Entries-r12)) OF	NAICS-Capability-Entry-
NAICS-Capability-Entry-r12 ::=	SEQUENCE {	

numberOfNAICS-CapableCC-r12 INTEGER(1..5), numberOfAggregatedPRB-r12 ENUMERATED { n50, n75, n100, n125, n150, n175, n200, n225, n250, n275, n300, n350,n400, n450, n500, spare}, . . . } SL-Parameters-r12 ::= SEQUENCE { commSimultaneousTx-r12 ENUMERATED {supported} OPTIONAL, commSupportedBands-r12 FreqBandIndicatorListEUTRA-r12 OPTIONAL, discSupportedBands-r12 SupportedBandInfoList-r12 OPTIONAL, discScheduledResourceAlloc-r12 ENUMERATED {supported} OPTTONAL. OPTIONAL, ENUMERATED {supported} disc-UE-SelectedResourceAlloc-r12 disc-SLSS-r12 ENUMERATED {supported} OPTIONAL, OPTIONAL discSupportedProc-r12 ENUMERATED {n50, n400} } SL-Parameters-v1310 ::= SEQUENCE { discSysInfoReporting-r13 ENUMERATED {supported} OPTIONAL, OPTIONAL, commMultipleTx-r13 ENUMERATED {supported} discInterFreqTx-r13 ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} discPeriodicSLSS-r13 OPTIONAL } SEQUENCE { SL-Parameters-v1430 ::= ue-AutonomousWithFullSensing-r14 ENUMERATED {supported} OPTIONAL, OPTIONAL, ue-AutonomousWithPartialSensing-r14 ENUMERATED {supported} OPTIONAL, sl-CongestionControl-r14 ENUMERATED {supported} OPTIONAL, v2x-TxWithShortResvInterval-r14 ENUMERATED {supported} OPTIONAL, v2x-numberTxRxTiming-r14 INTEGER(1..16) OPTIONAL, ENUMERATED {supported} ENUMERATED {supported} v2x-nonAdjacentPSCCH-PSSCH-r14 OPTIONAL, slss-TxRx-r14 OPTIONAL. v2x-SupportedBandCombinationList-r14 V2X-SupportedBandCombination-r14 OPTIONAL } SL-Parameters-v1530 ::= SEQUENCE { ENUMERATED {single, multiple} OPTIONAL, slss-SupportedTxFreq-r15 sl-64QAM-Tx-r15 ENUMERATED {supported} OPTIONAL, sl-TxDiversity-r15 ENUMERATED {supported} OPTIONAL. ue-CategorySL-r15 UE-CategorySL-r15 OPTIONAL. v2x-SupportedBandCombinationList-v1530 V2X-SupportedBandCombination-v1530 OPTIONAL } SL-Parameters-v1540 ::= SEQUENCE { ENUMERATED {supported} sl-640AM-Rx-r15 OPTIONAL, sl-RateMatchingTBSScaling-r15 ENUMERATED {supported} OPTIONAL, sl-LowT2min-r15 ENUMERATED {supported} OPTIONAL, v2x-SensingReportingMode3-r15 ENUMERATED {supported} OPTIONAL } UE-CategorySL-r15 ::= SEQUENCE { INTEGER(1..5), ue-CategorySL-C-TX-r15 INTEGER(1..4) ue-CategorySL-C-RX-r15 } V2X-SupportedBandCombination-r14 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF V2X-BandCombinationParameters-r14 V2X-SupportedBandCombination-v1530 ::= SEQUENCE (SIZE (1..maxBandComb-r13)) OF V2X-BandCombinationParameters-v1530 V2X-BandCombinationParameters-r14 ::= SEQUENCE (SIZE (1.. maxSimultaneousBands-r10)) OF V2X-BandParameters-r14 V2X-BandCombinationParameters-v1530 ::= SEQUENCE (SIZE (1.. maxSimultaneousBands-r10)) OF V2X-BandParameters-v1530 SupportedBandInfoList-r12 ::= SEQUENCE (SIZE (1..maxBands)) OF SupportedBandInfo-r12 SupportedBandInfo-r12 ::= SEQUENCE { ENUMERATED {supported} OPTIONAL support-r12 } FreqBandIndicatorListEUTRA-r12 ::= SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicator-r11 MMTEL-Parameters-r14 ::= SEQUENCE {

```
delayBudgetReporting-r14
                                                            ENUMERATED {supported} OPTIONAL,
                                                            ENUMERATED {supported} OPTIONAL,
    pusch-Enhancements-r14
    recommendedBitRate-r14
    recommendedBitRateQuery-r14
                                                            ENUMERATED {supported} OPTIONAL
}
SRS-CapabilityPerBandPair-r14 ::= SEQUENCE {
    retuningInfo
                                       SEQUENCE {
                                                 ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3,
n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5,
         rf-RetuningTimeDL-r14
                                                                 n7, sparel} OPTIONAL,
                                                  ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3,
n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5,
n7, spare1} OPTIONAL
         rf-RetuningTimeUL-r14
    }
}
SRS-CapabilityPerBandPair-v14b0 ::= SEQUENCE {
    srs-FlexibleTiming-r14 ENUMERATED {supported} OPTIONAL,
srs-HARQ-ReferenceConfig-r14 ENUMERATED {supported} OPTIO
                                                 ENUMERATED {supported} OPTIONAL
}
HighSpeedEnhParameters-r14 ::= SEQUENCE {
    measurementEnhancements-r14ENUMERATED {supported}OPTIONAL,demodulationEnhancements-r14ENUMERATED {supported}OPTIONAL,prach-Enhancements-r14ENUMERATED {supported}OPTIONAL
}
```

```
-- ASN1STOP
```

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
accessStratumRelease	-
Set to rel15 in this version of the specification. NOTE 7. additionalRx-Tx-PerformanceReg	
Indicates whether the UE supports the additional Rx and Tx performance requirement for a	-
given band combination as specified in TS 36.101 [42].	
alternativeTBS-Indices	-
Indicates whether the UE supports alternative TBS indices $h_{\text{BS}}$ 26A and 33A as specified in TS	
36.213 [23].	
alternativeTBS-Index	No
Indicates whether the UE supports alternative TBS index $I_{TBS}$ 33B as specified in TS 36.213	
[23].	
alternativeTimeToTrigger	No
Indicates whether the UE supports alternativeTimeToTrigger.	
altMCS-Table	-
Indicates whether the UE supports the 6-bit MCS table as specified in TS 36.212 [22] and TS 36.213 [23].	
aperiodicCSI-Reporting	No
Indicates whether the UE supports aperiodic CSI reporting with 3 bits of the CSI request field	INU
size as specified in TS 36.213 [23], clause 7.2.1 and/or aperiodic CSI reporting mode 1-0 and	
mode 1-1 as specified in TS 36.213 [23], clause 7.2.1. The first bit is set to "1" if the UE	
supports the aperiodic CSI reporting with 3 bits of the CSI request field size. The second bit is	
set to "1" if the UE supports the aperiodic CSI reporting mode 1-0 and mode 1-1.	
aperiodicCsi-ReportingSTTI	No
Indicates whether the UE supports aperiodic CSI reporting for short TTI as specified in TS	
36.213 [23], clause 7.2.1.	
appliedCapabilityFilterCommon	-
Contains the filter, applied by the UE, common for all MR-DC related capability containers that	
are requested and as defined by UE-CapabilityRequestFilterCommon IE in TS 38.331 [82]. assistInfoBitForLC	
Indicates whether the UE supports assistance information bit for local cache.	-
aul	_
Indicates whether the UE supports AUL as specified n TS 36.321 [6].	
bandCombinationListEUTRA	-
One entry corresponding to each supported band combination listed in the same order as in	
supportedBandCombination.	
BandCombinationParameters-v1090, BandCombinationParameters-v10i0,	-
BandCombinationParameters-v1270	
If included, the UE shall include the same number of entries, and listed in the same order, as in	
BandCombinationParameters-r10.	
BandCombinationParameters-v1130 The field is applicable to each supported CA bandwidth class combination (i.e. CA	-
configuration in TS 36.101 [42], clause 5.6A.1) indicated in the corresponding band	
combination. If included, the UE shall include the same number of entries, and listed in the	
same order, as in BandCombinationParameters-r10.	
bandEUTRA	-
E-UTRA band as defined in TS 36.101 [42]. In case the UE includes bandEUTRA-v9e0 or	
bandEUTRA-v1090, the UE shall set the corresponding entry of bandEUTRA (i.e. without	
suffix) or bandEUTRA-r10 respectively to maxFBI.	
bandListEUTRA	-
One entry corresponding to each supported E-UTRA band listed in the same order as in	
supportedBandListEUTRA.	
bandParameterList-v1380	-
If included, the UE shall include the same number of entries listed in the same order as the band entries in the corresponding band combination.	
band entries in the corresponding band combination. bandParametersUL, bandParametersDL	_
Indicates the supported parameters for the band. Each of CA-MIMO-ParametersUL and CA-	-
MIMO-ParametersDL can be included only once for one band in a single band combination	
entry.	
beamformed (in MIMO-CA-ParametersPerBoBCPerTM)	-
If signalled, the field indicates for a particular transmission mode, the UE capabilities	
concerning beamformed EBF/ FD-MIMO operation (class B) applicable for the concerned band	
combination.	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<b>beamformed (in MIMO-UE-ParametersPerTM)</b> Indicates for a particular transmission mode, the UE capabilities concerning beamformed EBF/ FD-MIMO operation (class B) applicable for band combinations for which the concerned capabilities are not signalled.	TBD
benefitsFromInterruption Indicates whether the UE power consumption would benefit from being allowed to cause interruptions to serving cells when performing measurements of deactivated SCell carriers for measCycleSCell of less than 640ms, as specified in TS 36.133 [16].	No
<i>bwPrefInd</i> Indicates whether the UE supports maximum PDSCH/PUSCH bandwidth preference indication.	-
<i>ca-BandwidthClass</i> The CA bandwidth class supported by the UE as defined in TS 36.101 [42], Table 5.6A-1. The UE explicitly includes all the supported CA bandwidth class combinations in the band combination signalling. Support for one CA bandwidth class does not implicitly indicate support for another CA bandwidth class.	-
ca-IdleModeMeasurements Indicates whether UE supports reporting measurements performed during RRC_IDLE.	-
ca-IdleModeValidityArea Indicates whether UE supports validity area for IDLE measurements during RRC_IDLE. cch-IM-RefRecTypeA-OneRX-Port	-
This field defines whether the DL Category 1bis or the DL Category M2 UE supports Type A downlink control channel interference mitigation (CCH-IM) receiver "LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH/EPDCCH receive processing (Enhanced downlink control channel performance requirements Type A in TS 36.101 [6]).	-
InterfMitigation-MaxNumCCs The field <i>cch-InterfMitigation-RefRecTypeA</i> defines whether the UE supports Type A downlink control channel interference mitigation (CCH-IM) receiver "LMMSE-IRC + CRS-IC" for PDCCH/PCFICH/PHICH/EPDCCH receive processing (Enhanced downlink control channel performance requirements Type A in the TS 36.101 [6]). The field <i>cch-InterfMitigation- RefRecTypeB</i> defines whether the UE supports Type B downlink CCH-IM receiver "E-LMMSE- IRC + CRS-IC" for PDCCH/PCFICH/PHICH receive processing in synchronous networks (Enhanced downlink control channel performance requirements Type B in the TS 36.101 [6]). The UE supporting the capability defined by <i>cch-InterfMitigation-RefRecTypeB-r13</i> shall also support the capability defined by <i>cch-InterfMitigation-RefRecTypeA-r13</i> .	
If the UE sets one or more of the fields <i>cch-InterfMitigation-RefRecTypeA</i> and <i>cch-InterfMitigation-RefRecTypeB</i> to "supported", the UE shall include the parameter <i>cch-InterfMitigation-MaxNumCCs</i> to indicate that the UE supports CCH-IM on at least one arbitrary downlink CC for up to <i>cch-InterfMitigation-MaxNumCCs</i> downlink CC CA configuration. The UE shall not include the parameter <i>cch-InterfMitigation-MaxNumCCs</i> if neither <i>cch-InterfMitigation-RefRecTypeA</i> nor <i>cch-InterfMitigation-RefRecTypeB</i> is present. The UE may not perform CCH-IM on more than 1 DL CCs. For example, the UE sets " <i>cch-InterfMitigation-MaxNumCCs</i> = 3" to indicate that UE supports CCH-IM on at least one DL CC for supported non-CA, 2DL CA and 3DL CA configurations. For CA scenarios, the CCH-IM is guaranteed to be supported on at least one arbitrary component carrier.	
cdma2000-NW-Sharing Indicates whether the UE supports network sharing for CDMA2000.	-
ce-ClosedLoopTxAntennaSelection Indicates whether the UE supports UL closed-loop Tx antenna selection in CE mode A, as specified in TS 36.212 [22].	Yes
ce-CQI-AlternativeTable Indicates whether the UE supports alternative CQI table in CE mode A. See TS 36.213 [22].	-
<i>ce-CRS-IntfMitig</i> Indicates whether UE supports CRS interference mitigation, i.e., value <i>supported</i> indicates UE does not rely on the CRS outside certain PRBs and subframes as defined in TS 36.133 [16], clauses 3.6.1.2 and 3.6.1.3, and TS 36.213 [23] when operating in coverage enhancement mode.	-
<i>ce-HARQ-AckBundling</i> Indicates whether the UE supports HARQ-ACK bundling in half duplex FDD in CE mode A, as specified in TS 36.212 [22] and TS 36.213 [23].	Yes
<i>ce-ModeA, ce-ModeB</i> Indicates whether the UE supports operation in CE mode A and/or B, as specified in TS 36.211 [21] and TS 36.213 [23].	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
ceMeasurements	-
Indicates whether the UE supports intra-frequency RSRQ measurements and inter-frequency	
RSRP and RSRQ measurements in RRC_CONNECTED, as specified in TS 36.133 [16] and	
TS 36.304 [4].	
ce-PDSCH-64QAM	-
Indicates whether the UE supports 64QAM for non-repeated unicast PDSCH in CE mode A.	
ce-PDSCH-FlexibleStartPRB-CE-ModeA, ce-PDSCH-FlexibleStartPRB-CE-ModeB,	-
ce-PUSCH-FlexibleStartPRB-CE-ModeA, ce-PUSCH-FlexibleStartPRB-CE-ModeB	
This field indicates whether UE supports flexible starting PRB for PDSCH/PUSCH when	
operating in coverage enhancement mode A/B, as specified in TS 36.211 [21] and TS 36.213	
[22].	
ce-PDSCH-PUSCH-Enhancement	No
Indicates whether the UE supports new numbers of repetitions for PUSCH and modulation	
restrictions for PDSCH/PUSCH in CE mode A as specified in TS 36.212 [22] and TS 36.213	
[23].	
ce-PDSCH-PUSCH-MaxBandwidth	Yes
Indicates the maximum supported PDSCH/PUSCH channel bandwidth in CE mode A and B,	
as specified in TS 36.212 [22] and TS 36.213 [23]. Value bw5 corresponds to 5 MHz and value	
bw20 corresponds to 20 MHz. If the field is absent the maximum PDSCH/PUSCH channel	
bandwidth in CE mode A and B is 1.4 MHz. If the setting of this parameter is 20 MHz, the max	
supported PUSCH channel bandwidth in CE mode A is 5 MHz. The maximum PUSCH channel	
bandwidth in CE mode B is 1.4 MHz regardless of the setting of this parameter. Parameter:	
transmission bandwidth configuration, see TS 36.101 [42], table 5.6-1.	
ce-PDSCH-TenProcesses	Yes
Indicates whether the UE supports 10 DL HARQ processes in FDD in CE mode A.	
ce-PUCCH-Enhancement	No
Indicates whether the UE supports repetition levels 64 and 128 for PUCCH in CE Mode B, as	
specified in TS 36.211 [21] and in TS 36.213 [23].	
ce-PUSCH-NB-MaxTBS	Yes
Indicates whether the UE supports 2984 bits max UL TBS in 1.4 MHz in CE mode A operation,	
as specified in TS 36.212 [22] and TS 36.213 [23].	
ce-PUSCH-SubPRB-Allocation	-
Indicates whether the UE supports sub-PRB resource allocation for PUSCH in CE mode A or	
B, as specified in TS 36.211 [21], TS 36.212 [22] and TS 36.213 [23].	N.L
ce-RetuningSymbols	No
Indicates the number of retuning symbols in CE mode A and B as specified in TS 36.211 [21].	
Value n0 corresponds to 0 retuning symbols and value n1 corresponds to 1 retuning symbol. If the field is absent the number of retuning symbols in CE mode A and B is 2.	
	No
ce-SchedulingEnhancement	No
Indicates whether the UE supports dynamic HARQ-ACK delay for HD-FDD in CE mode A as	
specified in TS 36.212 [22] and TS 36.213 [23]. ce-SRS-Enhancement	Vee
	Yes
Indicates whether the UE supports SRS coverage enhancement in TDD with support of SRS combs 2 and 4 as specified in TS 36.213 [23]. This field can be included only if <i>ce-SRS</i> -	
EnhancementWithoutComb4 is not included.	
ce-SRS-EnhancementWithoutComb4	
	-
Indicates whether the UE supports SRS coverage enhancement in TDD with support of SRS	
comb 2 but without support of SRS comb 4 as specified in TS 36.213 [23]. This field can be included only if <i>ce-SRS-Enhancement</i> is not included.	
ce-SwitchWithoutHO	
	-
Indicates whether the UE supports switching between normal mode and enhanced coverage mode without handover.	
ce-UL-HARQ-ACK-Feedback	-
This field indicates whether UE supports uplink HARQ ACK feedback when operating in	
coverage enhancement, as specified in TS36.213 [22].	тоо
channelMeasRestriction	TBD
Indicates for a particular transmission mode whether the UE supports channel measurement	
restriction.	K. /
codebook-HARQ-ACK	No
Indicates whether the UE supports determining HARQ ACK codebook size based on the DAI-	
ased solution and/or the number of configured CCs. The first bit is set to "1" if the UE supports the DAI-based codebook size determination. The second bit is set to "1" if the UE supports the	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>commMultipleTx</i> Indicates whether the UE supports multiple transmissions of sidelink communication to different destinations in one SC period. If <i>commMultipleTx-r13</i> is set to supported then the UE support 8 transmitting sidelink processes.	-
<i>commSimultaneousTx</i> Indicates whether the UE supports simultaneous transmission of EUTRA and sidelink communication (on different carriers) in all bands for which the UE indicated sidelink support in a band combination (using <i>commSupportedBandsPerBC</i> ).	-
<i>commSupportedBands</i> Indicates the bands on which the UE supports sidelink communication, by an independent list of bands i.e. separate from the list of supported E-UTRA band, as indicated in <i>supportedBandListEUTRA</i> .	-
<b>commSupportedBandsPerBC</b> Indicates, for a particular band combination, the bands on which the UE supports simultaneous reception of EUTRA and sidelink communication. If the UE indicates support simultaneous transmission (using <i>commSimultaneousTx</i> ), it also indicates, for a particular band combination, the bands on which the UE supports simultaneous transmission of EUTRA and sidelink communication. The first bit refers to the first band included in <i>commSupportedBands</i> , with value 1 indicating sidelink is supported.	-
<b>configN (in MIMO-CA-ParametersPerBoBCPerTM)</b> If signalled, the field indicates for a particular transmission mode whether the UE supports non- precoded EBF/ FD-MIMO (class A) related configuration N for the concerned band combination.	-
configN (in MIMO-UE-ParametersPerTM) Indicates for a particular transmission mode whether the UE supports non-precoded EBF/ FD- MIMO (class A) related configuration N for band combinations for which the concerned capabilities are not signalled.	TBD
crossCarrierScheduling	Yes
crossCarrierScheduling-B5C	No
Indicates whether the UE supports cross carrier scheduling beyond 5 DL CCs. crossCarrierSchedulingLAA-DL	
Indicates whether the UE supports cross-carrier scheduling from a licensed carrier for LAA cell(s) for downlink. This field can be included only if <i>downlinkLAA</i> is included.	
<i>crossCarrierSchedulingLAA-UL</i> Indicates whether the UE supports cross-carrier scheduling from a licensed carrier for LAA cell(s) for uplink. This field can be included only if <i>uplinkLAA</i> is included.	-
crs-DiscoverySignalsMeas Indicates whether the UE supports CRS based discovery signals measurement, and PDSCH/EPDCCH RE mapping with zero power CSI-RS configured for discovery signals.	FFS
<i>crs-IM-TM1-toTM9-OneRX-Port</i> Indicates whether the DL Cateogry 1bis UE ot the DL Category M2 UE supports CRS interference mitigation (IM) while operating in the following transmission modes (TM): TM 1, TM 2,, TM 8 and TM 9.	-
crs-InterfHandI Indicates whether the UE supports CRS interference handling.	Yes
<i>crs-InterfMitigationTM10</i> The field defines whether the UE supports CRS interference mitigation in transmission mode 10. The UE supporting the <i>crs-InterfMitigationTM10</i> capability shall also support the <i>crs-InterfHandI</i> capability.	No
<i>crs-InterfMitigationTM1toTM9</i> Indicates whether the UE supports CRS interference mitigation (IM) while operating in the following transmission modes (TM): TM 1, TM 2,, TM 8 and TM 9. The UE shall not include the field if it does not support CRS IM in TMs 1-9. If the field is present, the UE supports CRS-IM on at least one arbitrary downlink CC for up to <i>crs-InterfMitigationTM1toTM9-r13</i> downlink CC CA configuration. The UE signals <i>crs-InterfMitigationTM1toTM9-r13</i> value to indicate the maximum <i>crs-InterfMitigationTM1toTM9-r13</i> downlink CC CA configuration where UE may apply CRS IM. For example, the UE sets " <i>crs-InterfMitigationTM1toTM9-r13</i> = 3" to indicate that the UE supports CRS-IM on at least one DL CC for supported non-CA, 2DL CA and 3DL CA configurations. The UE supporting the <i>crs-InterfMitigationTM1toTM9-r13</i> capability shall also support the <i>crs-InterfHandI-r11</i> capability.	-
<i>crs-IntfMitig</i> Indicate whether the UE supports CRS interference mitigation as specified in TS 36.133 [16], clause 3.6.1.1.	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>crs-LessDwPTS</i> Indicates whether the UE supports TDD special subframe configuration 10 without CRS transmission on the 5th symbol of DwPTS, i.e. <i>ssp10-CRS-LessDwPTS</i> , as specified in TS 36.211 [17].	-
csi-ReportingAdvanced, csi-ReportingAdvancedMaxPorts (in MIMO-CA-	-
<b>ParametersPerBoBCPerTM)</b> If signalled, the field indicates that for a particular transmission mode, the maximum number of CSI-RS ports supported by the UE for advanced CSI reporting is different in the concerned band of band combination than the value indicated by the field <i>csi-ReportingAdvanced</i> or <i>csi-</i> <i>ReportingAdvancedMaxPorts</i> in <i>MIMO-UE-ParametersPerTM</i> . The UE shall not include both <i>csi-ReportingAdvanced</i> and <i>csi-ReportingAdvancedMaxPorts</i> for a particular transmission mode in the concerned band of band combination.	
csi-ReportingAdvanced, csi-ReportingAdvancedMaxPorts (in MIMO-UE-	FFS
<b>ParametersPerTM)</b> Indicates for a particular transmission mode the maximum number of CSI-RS ports supported by the UE for advanced CSI reporting. The field <i>csi-ReportingAdvanced</i> indicates 32 CSI-RS ports whereas <i>csi-ReportingAdvancedMaxPorts</i> indicates 8, 12, 16, 20, 24 or 28 CSI-RS ports. The UE shall not include both <i>csi-ReportingAdvanced</i> and <i>csi-ReportingAdvancedMaxPorts</i> for a particular transmission mode.	
<i>csi-ReportingNP (in MIMO-CA-ParametersPerBoBCPerTM)</i> If signalled, value <i>different</i> indicates that for a particular transmission mode, the CSI reporting on non-precoded CSI-RS with 20, 24, 28 or 32 antenna ports for the concerned band of band combination is different than the value indicated by field <i>csi-ReportingNP</i> in <i>MIMO-UE-</i> <i>ParametersPerTM</i> .	-
<i>csi-ReportingNP (in MIMO-UE-ParametersPerTM)</i> Indicates for a particular transmission mode whether the UE supports CSI reporting on non- precoded CSI-RS with 20, 24, 28, or 32 antenna ports for band combinations for which the concerned capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> , and the FD- MIMO processing capability condition as described in NOTE 8 is satisfied.	FFS
csi-RS-DiscoverySignalsMeas Indicates whether the UE supports CSI-RS based discovery signals measurement. If this field is included, the UE shall also include crs-DiscoverySignalsMeas.	FFS
csi-RS-DRS-RRM-MeasurementsLAA Indicates whether the UE supports performing RRM measurements on LAA cell(s) based on CSI-RS-based DRS. This field can be included only if <i>downlinkLAA</i> is included.	-
csi-RS-EnhancementsTDD Indicates for a particular transmission mode whether the UE supports CSI-RS enhancements applicable for TDD.	Yes
<i>csi-SubframeSet</i> Indicates whether the UE supports REL-12 DL CSI subframe set configuration, REL-12 DL CSI subframe set dependent CSI measurement/feedback, configuration of up to 2 CSI-IM resources for a CSI process with no more than 4 CSI-IM resources for all CSI processes of one frequency if the UE supports tm10, configuration of two ZP-CSI-RS for tm1 to tm9, PDSCH RE mapping with two ZP-CSI-RS configurations, and EPDCCH RE mapping with two ZP-CSI-RS configurations if the UE supports EPDCCH. This field is only applicable for UEs supporting TDD.	Yes
<i>dataInactMon</i> Indicates whether the UE supports the data inactivity monitoring as specified in TS 36.321 [6].	-
<i>dc-Support</i> Including this field indicates that the UE supports synchronous DC and power control mode 1. Including this field for a band combination entry comprising of single band entry indicates that the UE supports intra-band contiguous DC. Including this field for a band combination entry comprising of two or more band entries, indicates that the UE supports DC for these bands and that the serving cells corresponding to a band entry shall belong to one cell group (i.e. MCG or SCG). Including field <i>asynchronous</i> indicates that the UE supports asynchronous DC and power control mode 2. Including this field for a TDD/FDD band combination indicates that the UE supports TDD/FDD DC for this band combination.	-
delayBudgetReporting Indicates whether the UE supports delay budget reporting. demodulationEnhancements	No
This field defines whether the UE supports advanced receiver in SFN scenario as specified in TS 36.101 [42].	-
densityReductionNP, densityReductionBF Indicates whether the UE supports CSI-RS density reduction with values 1, 1/2 and 1/3 for non-precoded CSI-RS and beamformed CSI-RS respectively.	FFS

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>deviceType</i> UE may set the value to " <i>noBenFromBatConsumpOpt</i> " when it does not foresee to particularly benefit from NW-based battery consumption optimisation. Absence of this value means that the device does benefit from NW-based battery consumption optimisation.	-
<i>diffFallbackCombReport</i> Indicates that the UE supports reporting of UE radio access capabilities for the CA band combinations asked by the eNB as well as, if any, reporting of different UE radio access capabilities for their fallback band combination as specified in TS 36.306 [5]. The UE does not report fallback combinations if their UE radio access capabilities are the same as the ones for the CA band combination asked by the eNB.	-
<i>differentFallbackSupported</i> Indicates that the UE supports different capabilities for at least one fallback case of this band combination.	-
<i>directSCellActivation</i> Indicates whether the UE supports having an SCell configured in activated SCell state.	-
directSCellHibernation Indicates whether the UE supports having an SCell configured in dormant SCell state.	-
<i>discInterFreqTx</i> Indicates whether the UE support sidelink discovery announcements either a) on the primary frequency only or b) on other frequencies also, regardless of the UE configuration (e.g. CA, DC). The UE may set discInterFreqTx to supported when having a separate transmitter or if it can request sidelink discovery transmission gaps.	-
<i>discoverySignalsInDeactSCell</i> Indicates whether the UE supports the behaviour on DL signals and physical channels when SCell is deactivated and discovery signals measurement is configured as specified in TS 36.211 [21], clause 6.11A. This field is included only if UE supports carrier aggregation and includes <i>crs-DiscoverySignalsMeas</i> .	FFS
<i>discPeriodicSLSS</i> Indicates whether the UE supports periodic (i.e. not just one time before sidelink discovery announcement) Sidelink Synchronization Signal (SLSS) transmission and reception for sidelink discovery.	-
<i>discScheduledResourceAlloc</i> Indicates whether the UE supports transmission of discovery announcements based on network scheduled resource allocation.	-
<i>disc-UE-SelectedResourceAlloc</i> Indicates whether the UE supports transmission of discovery announcements based on UE autonomous resource selection.	-
<i>disc-SLSS</i> Indicates whether the UE supports Sidelink Synchronization Signal (SLSS) transmission and reception for sidelink discovery.	-
<i>discSupportedBands</i> Indicates the bands on which the UE supports sidelink discovery. One entry corresponding to each supported E-UTRA band, listed in the same order as in <i>supportedBandListEUTRA</i> .	-
discSupportedProc Indicates the number of processes supported by the UE for sidelink discovery.	-
<i>discSysInfoReporting</i> Indicates whether the UE supports reporting of system information for inter-frequency/PLMN sidelink discovery.	-
<i>dl-256QAM</i> Indicates whether the UE supports 256QAM in DL on the band.	-
<i>dl-1024QAM</i> Indicates whether the UE supports 1024QAM in DL on the band or on the band within the band combination. When <i>dl-1024QAM-ScalingFactor</i> and <i>dl-1024QAM-TotalWeightedLayers</i> are included, the UE supports 1024QAM in a set of CCs in a band combination if the CCs belong to bands indicated to support 1024QAM in that band combination and the 1024QAM processing capability condition as specified in equation 4.3.5.31-1 in TS 36.306 [5] is satisfied.	-
<i>dl-1024QAM-ScalingFactor</i> Indicates scaling factor for processing a CC configured with 1024QAM with respect to a CC not configured with 1024QAM as described in 4.3.5.31 in TS 36.306 [5]. Value <i>v1</i> indicates 1, value <i>v1dot2</i> indicates 1.2 and value <i>v1dot25</i> indicates 1.25.	-
<i>dl-1024QAM-TotalWeightedLayers</i> Indicates total number of weighted layers the UE can process for 1024QAM as described in 4.3.5.31 in TS 36.306 [5]. Actual value = (10 + indicated value x 2), i.e., value 0 indicates 10 layers, value 1 indicates 12 layers and so on.	-

UE-EUTRA-Capability field descriptions	
<i>dI-1024QAM-Slot</i> Indicates whether the UE supports 1024QAM in DL on the band for slot TTI operation.	-
dl-1024QAM-SubslotTA-1	
Indicates whether the UE supports 1024QAM in DL on the band for subslot TTI operation with TA set 1.	
dl-1024QAM-SubslotTA-2	-
ndicates whether the UE supports 1024QAM in DL on the band for subslot TTI operation with IA set 2, dmrsBasedSPDCCH-nonMBSFN	
dmrs-BasedSPDCCH-MBSFN ndicates whether the UE supports sDCI monitoring in DMRS based SPDCCH for MBSFN subframe. If UE supports this, it also provides the corresponding DMRS based SPDCCH capability in <i>min-Proc-TimelineSubslot</i> .	-
dmrs-BasedSPDCCH-nonMBSFN ndicates whether the UE supports sDCI monitoring in DMRS based SPDCCH for non-MBSFN subframe. If UE supports this, it also provides the corresponding DMRS based SPDCCH capability in <i>min-Proc-TimelineSubslot</i> .	-
dmrs-Enhancements (in MIMO-CA-ParametersPerBoBCPerTM) f signalled, the field indicates for a particular transmission mode, that for the concerned band combination the DMRS enhancements are different than the value indicated by field dmrs- Enhancements in MIMO-UE-ParametersPerTM.	-
dmrs-Enhancements (in MIMO-UE-ParametersPerTM) ndicates for a particular transmission mode whether the UE supports DMRS enhancements or the indicated transmission mode.	TBC
Imrs-LessUpPTS	No
ndicates whether the UE supports not to transmit DMRS for PUSCH in UpPTS.	
Imrs-OverheadReduction ndicates whether the UE supports OCC4 for rank 3 and 4 transmission as specified in clause 5.3.3.1.5C of TS 36.212 [22].	-
<i>Imrs-PositionPattern</i> ndicates whether the UE supports uplink DMRS position pattern 'D D D' in subslot #5 with application of the 1/6 as the TBS scaling factor.	-
dmrs-RepetitionSubslotPDSCH ndicates whether the UE supports back-to-back 3/4-layer DMRS reception in two consecutive subslots across subframe boundary for subslot-PDSCH.	-
dmrs-SharingSubslotPDSCH ndicates whether the UE supports DMRS sharing in two consecutive subslots across subframe boundary for subslot-PDSCH.	-
dormantSCellState ndicates whether UE supports Dormant SCell state (i.e. SCell state with CQI and RRM neasurement reporting but no PDCCH monitoring).	-
downlinkLAA Presence of the field indicates that the UE supports downlink LAA operation including dentification of downlink transmissions on LAA cell(s) for full downlink subframes, decoding of common downlink control signalling on LAA cell(s), CSI feedback for LAA cell(s), RRM neasurements on LAA cell(s) based on CRS-based DRS.	-
drb-TypeSCG ndicates whether the UE supports SCG bearer.	-
Irb-TypeSplit Indicates whether the UE supports split bearer except for PDCP data transfer in UL. Itm	-
ndicates whether the UE supports DTM in GERAN.	-
ndicates whether the UE supports UP-EDT. CSFB-1XRTT	Yes
ndicates whether the UE supports enhanced CS fallback to CDMA2000 1xRTT or not.	
<b>CCSFB-ConcPS-Mob1XRTT</b> ndicates whether the UE supports concurrent enhanced CS fallback to CDMA2000 1xRTT and PS handover/ redirection to CDMA2000 HRPD.	Yes
<b>CSFB-dual-1XRTT</b> ndicates whether the UE supports enhanced CS fallback to CDMA2000 1xRTT for dual Rx/Tx configuration. This bit can only be set to supported if <i>tx-Config1XRTT</i> and <i>rx-Config1XRTT</i> are both set to dual.	Yes

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
e-HARQ-Pattern-FDD Indicates whether the UE supports enhanced HARQ pattern for TTI bundling operation for FDD.	Yes
eLCID-Support Indicates whether the UE supports LCID "10000" and MAC PDU subheader containing the eLCID field as described in TS 36.321 [6].	-
<i>emptyUnicastRegion</i> Indicates whether the UE supports unicast reception in subframes with empty unicast control region as described in TS 36.213 [23] clause 12. This field can be included only if <i>unicast-fembmsMixedSCell</i> and <i>crossCarrierScheduling</i> are included.	No
en-DC Indicates whether the UE supports EN-DC.	No
endingDwPTS Indicates whether the UE supports reception ending with a subframe occupied for a DwPTS- duration as described in TS 36.211 [21] and TS 36.213 [23]. This field can be included only if <i>downlinkLAA</i> is included.	-
<i>Enhanced-4TxCodebook</i> Indicates whether the UE supports enhanced 4Tx codebook.	No
enhancedDualLayerTDD Indicates whether the UE supports enhanced dual layer (PDSCH transmission mode 8) for TDD or not.	-
ePDCCH Indicates whether the UE can receive DCI on UE specific search space on Enhanced PDCCH.	Yes
epdcch-SPT-differentCells Indicates whether the UE supports EPDCCH and short processing time on different serving cells.	-
epdcch-STTI-differentCells Indicates whether the UE supports EPDCCH and sTTI on different serving cells.	-
e-RedirectionUTRA e-RedirectionUTRA-TDD Indicates whether the UE supports enhanced redirection to UTRA TDD to multiple carrier frequencies both with and without using related SIB provided by RRCConnectionRelease or not.	Yes Yes
eutra-5GC Indicates whether the UE supports E-UTRA/5GC.	Yes
eutra-5GC-HO-ToNR-FDD-FR1 Indicates whether the UE supports handover from E-UTRA/5GC to NR FDD FR1.	Yes
eutra-5GC-HO-ToNR-TDD-FR1 Indicates whether the UE supports handover from E-UTRA/5GC to NR TDD FR1.	Yes
eutra-5GC-HO-ToNR-FDD-FR2 Indicates whether the UE supports handover from E-UTRA/5GC to NR FDD FR2.	Yes
eutra-5GC-HO-ToNR-TDD-FR2 Indicates whether the UE supports handover from E-UTRA/5GC to NR TDD FR2.	Yes
<i>eutra-CGI-Reporting-ENDC</i> Indicates whether the UE supports Intra-RAT report CGI procedure when it is configured with (NG) EN-DC wherein either MN and SN have different DRX cycles, or on-duration configured by MN does not contain on-duration configured by SN if their DRX cycles are same.	Yes
eutra-EPC-HO-ToNR-FDD-FR1 Indicates whether the UE supports handover from E-UTRA/EPC to NR FDD FR1.	Yes
eutra-EPC-HO-ToNR-TDD-FR1 Indicates whether the UE supports handover from E-UTRA/EPC to NR TDD FR1.	Yes
eutra-EPC-HO-ToNR-FDD-FR2 Indicates whether the UE supports handover from E-UTRA/EPC to NR FDD FR2.	Yes
eutra-EPC-HO-ToNR-TDD-FR2 Indicates whether the UE supports handover from E-UTRA/EPC to NR TDD FR2.	Yes
eutra-EPC-HO-EUTRA-5GC Indicates whether the UE supports handover between E-UTRA/EPC and E-UTRA/5GC. eventB2	Yes No
Indicates whether the UE supports event B2. A UE supporting NR SA operation shall set this bit to <i>supported</i> .	INO
extendedFreqPriorities Indicates whether the UE supports extended E-UTRA frequency priorities indicated by cellReselectionSubPriority field. A UE supporting NR SA operation shall set this bit to supported.	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
extendedLCID-Duplication	-
Indicates whether the UE supports use of extended LCIDs 32-38 for PDCP duplication. extendedLongDRX	
Indicates whether the UE supports extended long DRX cycle values of 5.12s and 10.24s in RRC_CONNECTED.	-
<i>extendedMAC-LengthField</i> Indicates whether the UE supports the MAC header with L field of size 16 bits as specified in TS 36.321 [6], clause 6.2.1.	-
extendedMaxMeasId Indicates whether the UE supports extended number of measurement identies as defined by maxMeasId-r12.	No
extendedMaxObjectId Indicates whether the UE supports extended number of measurement object identies as defined by maxObjectId-r13.	No
<i>extendedNumberOfDRBs</i> Indicates whether the UE supports up to 15 DRBs. The UE shall support any combination of RLC AM and RLC UM entities for the configured DRBs.	-
extendedPollByte Indicates whether the UE supports extended pollByte values as defined by <i>pollByte-r14</i> .	-
<i>extended-RLC-LI-Field</i> Indicates whether the UE supports 15 bit RLC length indicator.	-
extendedRLC-SN-SO-Field	-
Indicates whether the UE supports 16 bits of RLC sequence number and segmentation offset. <i>extendedRSRQ-LowerRange</i> Indicates whether the UE supports the extended RSRQ lower value range from -34dB to -	No
19.5dB in measurement configuration and reporting as specified in TS 36.133 [16]. <i>fdd-HARQ-TimingTDD</i> Indicates whether UE supports FDD HARQ timing for TDD SCell when configured with TDD PCell.	Yes
featureGroupIndicators, featureGroupIndRel9Add, featureGroupIndRel10 The definitions of the bits in the bit string are described in Annex B.1 (for featureGroupIndicators and featureGroupIndRel9Add) and in Annex C.1 (for featureGroupIndRel10).	Yes
featureSetsDL-PerCC In MR-DC, indicates a set of features that the UE supports on one component carrier in a bandwidth class for a band in a given band combination. The UE shall hence include at least as many <i>FeatureSetDL-PerCC-Id</i> in this list as the number of carriers it supports according to the <i>ca-bandwidthClassDL</i> , except if indicating additional functionality by reducing the number of <i>FeatureSetDownlinkPerCC-Id</i> in the feature set. The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the <i>FeatureSetDL-PerCC-Id</i> in this list.	-
<i>FeatureSetDL-PerCC-Id</i> In MR-DC, indicates the index position of the <i>FeatureSetDL-PerCC-r15</i> in the <i>featureSetsDL-PerCC-r15</i> list. Value 0 corresponds to the first element in the list, value 1 corresponds to the second element in the list, and so on. Value 32 is not used.	-
featureSetsUL-PerCC In MR-DC, indicates a set of features that the UE supports on one component carrier in a bandwidth class for a band in a given band combination. The UE shall hence include at least as many <i>FeatureSetUL-PerCC-Id</i> in this list as the number of carriers it supports according to the <i>ca-bandwidthClassUL</i> , except if indicating additional functionality by reducing the number of <i>FeatureSetDownlinkPerCC-Id</i> in the feature set. The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the <i>FeatureSetUL-PerCC-Id</i> in this list.	-
<i>FeatureSetUL-PerCC-Id</i> In MR-DC, indicates the index position of the <i>FeatureSetUL-PerCC-r15</i> in the <i>featureSetsUL-PerCC-r15</i> list. Value 0 corresponds to the first element in the list, value 1 corresponds to the second element in the list, and so on. Value 32 is not used. <i>fembmsMixedCell</i>	-
Indicates whether the UE in RRC_CONNECTED supports MBMS reception with 15 kHz subcarrier spacings via MBSFN from FeMBMS/Unicast mixed cells on a frequency indicated in an <i>MBMSInterestIndication</i> message.	
<i>fembmsDedicatedCell</i> Indicates whether the UE in RRC_CONNECTED supports MBMS reception with 15 kHz subcarrier spacings via MBSFN from MBMS-dedicated cells on a frequency indicated in an <i>MBMSInterestIndication</i> message.	

UE-EUTRA-Capability field descriptions	FDD, TDD diff
flexibleUM-AM-Combinations	-
Indicates whether the UE supports any combination of RLC UM and RLC AM bearers as long	
as the total number of bearers is at most 8, regardless of what FGI20 indicates.	
flightPathPlan	-
Indicates whether UE supports reporting of flight path plan information.	
fourLayerTM3-TM4	
	-
Indicates whether the UE supports 4-layer spatial multiplexing for TM3 and TM4.	
fourLayerTM3-TM4 (in FeatureSetDL-PerCC)	-
Indicates whether the UE supports 4-layer spatial multiplexing for TM3 and TM4 for MR-DC	
within the indicated feature set. If this field is absent, UE supports two layer MIMO for	
TM3/TM4.	
fourLayerTM3-TM4-perCC	-
ndicates whether the UE supports 4-layer spatial multiplexing for TM3 and TM4 for the	
component carrier.	
frameStructureType-SPT	
	-
This field indicates the supported FS-type(s) for short processing time. The UE capability is	
reported per band combination. The reported FS-type(s) apply to the reported	
maxNumberCCs-SPT-r15 for the given band combination.	
freqBandPriorityAdjustment	-
Indicates whether the UE supports the prioritization of frequency bands in multiBandInfoList	
over the band in freqBandIndicator as defined by freqBandIndicatorPriority-r12.	
fregBandRetrieval	-
ndicates whether the UE supports reception of requestedFrequencyBands.	
halfDuplex	
f halfDuplex is set to true, only half duplex operation is supported for the band, otherwise full	_
duplex operation is supported.	
heightMeas	-
Indicates whether UE supports the measurement events H1/H2.	
ho-EUTRA-5GC-FDD-TDD	No
Indicates whether the UE supports handover between E-UTRA/5GC FDD and E-UTRA/5GC	
TDD.	
ho-InterfreqEUTRA-5GC	Yes
Indicates whether the UE supports inter frequency handover within E-UTRA/5GC.	
hybridCSI	FFS
Indicates whether the UE supports hybrid CSI transmission as described in TS 36.213 [23].	
immMeasBT	
	-
ndicates whether the UE supports Bluetooth measurements in RRC connected mode.	
immMeasWLAN	-
ndicates whether the UE supports WLAN measurements in RRC connected mode.	
ms-VoiceOverMCG-BearerEUTRA-5GC	No
ndicates whether the UE supports IMS voice over NR PDCP for MCG bearer for E-	
JTRA/5GC.	
ims-VoiceOverNR-FR1	No
ndicates whether the UE supports IMS voice over NR FR1.	INU
	N
ims-VoiceOverNR-FR2	No
ndicates whether the UE supports IMS voice over NR FR2.	
inactiveState	No
ndicates whether the UE supports RRC_INACTIVE.	
incMonEUTRA	No
ndicates whether the UE supports increased number of E-UTRA carrier monitoring in	
RRC_IDLE and RRC_CONNECTED, as specified in TS 36.133 [16].	
incMonUTRA	No
	INU
ndicates whether the UE supports increased number of UTRA carrier monitoring in RRC_IDLE	
and RRC_CONNECTED, as specified in TS 36.133 [16].	
inDeviceCoexInd	Yes
Indicates whether the UE supports in-device coexistence indication as well as autonomous	
denial functionality.	
inDeviceCoexInd-ENDC	-
Indicates whether the UE supports in-device coexistence indication for (NG)EN-DC operation	
ndicates whether the UE supports in-device coexistence indication for (NG)EN-DC operation. This field can be included only if <i>inDeviceCoexInd</i> is included. The UE supports	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>inDeviceCoexInd-HardwareSharingInd</i> Indicates whether the UE supports indicating hardware sharing problems when sending the	-
<i>InDeviceCoexIndication</i> , as well as omitting the TDM assistance information. A UE that supports hardware sharing indication shall also indicate support of LAA operation.	
inDeviceCoexInd-UL-CA	-
Indicates whether the UE supports UL CA related in-device coexistence indication. This field	
can be included only if <i>inDeviceCoexInd</i> is included. The UE supports <i>inDeviceCoexInd-UL-CA</i> in the same duplexing modes as it supports <i>inDeviceCoexInd</i> .	
interBandTDD-CA-WithDifferentConfig	-
Indicates whether the UE supports inter-band TDD carrier aggregation with different UL/DL configuration combinations. The first bit indicates UE supports the configuration combination of SCell DL subframes are a subset of PCell and PSCell by SIB1 configuration and the configuration combination of SCell DL subframes are a superset of PCell and PSCell by SIB1 configuration of SCell DL subframes are neither superset nor subset of PCell and PSCell by SIB1 configuration. This	
field is included only if UE supports inter-band TDD carrier aggregation.	
<i>interferenceMeasRestriction</i> Indicates whether the UE supports interference measurement restriction.	TBD
interFregBandList	-
One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.	
interFreqNeedForGaps	-
Indicates need for measurement gaps when operating on the E-UTRA band given by the entry in <i>bandListEUTRA</i> or on the E-UTRA band combination given by the entry in <i>bandCombinationListEUTRA</i> and measuring on the E-UTRA band given by the entry in <i>interFreqBandList</i> .	
<i>interFreqProximityIndication</i> Indicates whether the UE supports proximity indication for inter-frequency E-UTRAN CSG member cells.	-
interFreqRSTD-Measurement	Yes
Indicates whether the UE supports inter-frequency RSTD measurements for OTDOA positioning, as specified in TS 36.355 [54].	
interFreqSI-AcquisitionForHO	Yes
Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring inter-frequency cell.	
interRAT-BandList	-
One entry corresponding to each supported band of another RAT listed in the same order as in the <i>interRAT-Parameters</i> . The NR bands reported in <i>SupportedBandListNR</i> are excluded from this list.	
interRAT-NeedForGaps	-
Indicates need for DL measurement gaps when operating on the E-UTRA band given by the entry in <i>bandListEUTRA or on the E-UTRA band combination given by the entry in bandCombinationListEUTRA</i> and measuring on the inter-RAT band given by the entry in the	
interRAT-BandList. interRAT-ParametersWLAN	
Indicates whether the UE supports WLAN measurements configured by <i>MeasObjectWLAN</i> with corresponding quantity and report configuration in the supported WLAN bands.	-
interRAT-PS-HO-ToGERAN	Yes
Indicates whether the UE supports inter-RAT PS handover to GERAN or not. intraBandContiguousCC-InfoList	
Indicates, per serving carrier of which the corresponding bandwidth class includes multiple	_
serving carriers (i.e. bandwidth class B, C, D and so on), the maximum number of supported layers for spatial multiplexing in DL and the maximum number of CSI processes supported. The number of entries is equal to the number of component carriers in the corresponding bandwidth class. The UE shall support the setting indicated in each entry of the list regardless	
of the order of entries in the list. The UE shall include the field only if it supports 4-layer spatial multiplexing in transmission mode3/4 for a subset of component carriers in the corresponding bandwidth class, or if the maximum number of supported layers for at least one component carrier is higher than <i>supportedMIMO-CapabilityDL-r10</i> in the corresponding bandwidth class, or if the number of CSI processes for at least one component carrier is higher than <i>supportedCSI-Proc-r11</i> in the corresponding band.	
This field may also be included for bandwidth class A but in such a case without including any sub-fields in <i>IntraBandContiguousCC-Info-r12</i> (see NOTE 6).	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>intraFreqA3-CE-ModeA</i> Indicates whether the UE when operating in CE Mode A supports <i>eventA3</i> for intra-frequency	-
neighbouring cells. <i>intraFreqA3-CE-ModeB</i> Indicates whether the UE when operating in CE Mode B supports <i>eventA3</i> for intra-frequency	-
neighbouring cells.	
<i>intraFreq-CE-NeedForGaps</i> Indicates need for measurement gaps when operating in CE on the E-UTRA band given by the entry in <i>supportedBandListEUTRA</i> .	
<i>intraFreqHO-CE-ModeA</i> Indicates whether the UE when operating in CE Mode A supports intra-frequency handover.	-
<i>intraFreqHO-CE-ModeB</i> Indicates whether the UE when operating in CE Mode B supports intra-frequency handover.	-
<i>intraFreqProximityIndication</i> Indicates whether the UE supports proximity indication for intra-frequency E-UTRAN CSG member cells.	-
<i>intraFreqSI-AcquisitionForHO</i> Indicates whether the UE supports, upon configuration of si-RequestForHO by the network, acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring intra-frequency cell.	Yes
<i>k-Max (in MIMO-CA-ParametersPerBoBCPerTM)</i> If signalled, the field indicates for a particular transmission mode the maximum number of NZP CSI RS resource configurations supported within a CSI process applicable for the concerned band combination.	No
<b>k-Max (in MIMO-UE-ParametersPerTM)</b> Indicates for a particular transmission mode the maximum number of NZP CSI RS resource configurations supported within a CSI process applicable for band combinations for which the concerned capabilities are not signalled.	TBD
<i>laa-PUSCH-Mode1</i> Indicates whether the UE supports LAA PUSCH mode 1 as defined in TS 36.213 [23].	-
Iaa-PUSCH-Mode2 Indicates whether the UE supports LAA PUSCH mode 2 as defined in TS 36.213 [23].	-
Iaa-PUSCH-Mode3 Indicates whether the UE supports LAA PUSCH mode 3 as defined in TS 36.213 [23].	-
IocationReport Indicates whether the UE supports reporting of its geographical location information to eNB. Iogged/MBSFNMeasurements	
Indicates whether the UE supports logged measurements for MBSFN. A UE indicating support for logged measurements for MBSFN shall also indicate support for logged measurements in Idle mode.	
<i>loggedMeasBT</i> Indicates whether the UE supports Bluetooth measurements in RRC idle mode.	-
loggedMeasurementsIdle Indicates whether the UE supports logged measurements in Idle mode.	-
IoggedMeasWLAN Indicates whether the UE supports WLAN measurements in RRC idle mode.	-
<i>logicalChannelSR-ProhibitTimer</i> Indicates whether the UE supports the <i>logicalChannelSR-ProhibitTimer</i> as defined in TS 36.321 [6].	-
IongDRX-Command Indicates whether the UE supports Long DRX Command MAC Control Element.	-
<i>Iwa</i> Indicates whether the UE supports LTE-WLAN Aggregation (LWA). The UE which supports LWA shall also indicate support of <i>interRAT-ParametersWLAN-r13</i> .	-
<i>Iwa-BufferSize</i> Indicates whether the UE supports the layer 2 buffer sizes for "with support for split bearers" as defined in Table 4.1-3 and 4.1A-3 of TS 36.306 [5] for LWA.	-
<i>Iwa-HO-WithoutWT-Change</i> Indicates whether the UE supports handover where LWA configuration is retained without WT change and using LWA end-marker for PDCP key change indication for LWA operation.	-
Iwa-RLC-UM Indicates whether the UE supports RLC UM for LWA bearer.	-
<i>Iwa-SplitBearer</i> Indicates whether the UE supports the split LWA bearer (as defined in TS 36.300 [9]).	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>Iwa-UL</i> Indicates whether the UE supports UL transmission over WLAN for LWA bearer.	-
Iwip	
Indicates whether the UE supports LTE/WLAN Radio Level Integration with IPsec Tunnel (LWIP). The UE which supports LWIP shall also indicate support of <i>interRAT</i> -	-
ParametersWLAN-r13.	
<i>Iwip-Aggregation-DL, Iwip-Aggregation-UL</i> Indicates whether the UE supports aggregation of LTE and WLAN over DL/UL LWIP. The UE that indicates support of LWIP aggregation over DL or UL shall also indicate support of <i>Iwip</i> .	-
makeBeforeBreak	
Indicates whether the UE supports intra-frequency Make-Before-Break handover, and whether the UE which indicates <i>dc-Parameters</i> supports intra-frequency Make-Before-Break SeNB change, as defined in TS 36.300 [9].	-
maximumCCsRetrieval	-
Indicates whether UE supports reception of requestedMaxCCsDL and requestedMaxCCsUL.	
maxLayersMIMO-Indication	-
Indicates whether the UE supports the network configuration of <i>maxLayersMIMO</i> . If the UE supports <i>fourLayerTM3-TM4</i> or <i>intraBandContiguousCC-InfoList</i> or <i>FeatureSetDL-PerCC</i> for MR-DC, UE supports the configuration of <i>maxLayersMIMO</i> for these cases regardless of indicating <i>maxLayersMIMO-Indication</i> .	
maxLayersSlotOrSubslotPUSCH	-
Indicates the maxiumum number of layers for slot-PUSCH or subslot-PUSCH transmission.	-
maxNumberCCs-SPT	-
Indicates the maximum number of supported CCs for short processing time. The UE capability is reported per band combination. The reported number of carriers applies to all the FS-type(s) <i>frameStructureType-SPT-r15</i> supported in a given band combination. Absence of the field indicates that 0 number of CCs are supported for short processing time.	
maxNumberDL-CCs, maxNumberUL-CCs	-
Indicates for each TTI combination "sTTI-SupportedCombinations", the maximum number of supported DL CCs/UL CCs for short TTI. Absence of the field indicates that 0 number of CCs are supported for short TTI.	
maxNumberDecoding	No
Indicates the maximum number of blind decodes in UE-specific search space per UE in one subframe for CA with more than 5 CCs as defined in TS 36.213 [23] which is supported by the UE. The number of blind decodes supported by the UE is the field value * 32. Only values 5 to 32 can be used in this version of the specification.	
maxNumberROHC-ContextSessions	-
Set to the maximum number of concurrently active ROHC contexts supported by the UE,	
excluding context sessions that leave all headers uncompressed. cs2 corresponds with 2	
(context sessions), cs4 corresponds with 4 and so on. The network ignores this field if the UE supports none of the ROHC profiles in <i>supportedROHC-Profiles</i> . If the UE indicates both	
maxNumberROHC-ContextSessions and maxNumberROHC-ContextSessions-r14, same	
value shall be indicated.	
maxNumberUpdatedCSI-Proc, maxNumberUpdatedCSI-Proc-SPT Indicates the maximum number of CSI processes to be updated across CCs.	No
mailate the maximum number of CSI processes to be updated across CCs. maxNumberUpdatedCSI-Proc-STTI-Comb77, maxNumberUpdatedCSI-Proc-STTI-	
Comb27, maxNumberUpdatedCSI-Proc-STTI-Comb22-Set1, maxNumberUpdatedCSI- Proc-STTI-Comb22-Set2	
Indicates the maximum number of CSI processes to be updated across CCs. Comb77 is applicable for {slot, slot}, Comb27 for {subslot, slot}, Comb22-Set1 for	
<pre>{subslot, subslot} processing timeline set 1 and the Comb22-Set2 for {subslot, subslot} processing timeline set 2. mbms-AsyncDC</pre>	
Indicates whether the UE in RRC_CONNECTED supports MBMS reception via MRB on a	-
frequency indicated in an <i>MBMSInterestIndication</i> message, where (according to <i>supportedBandCombination</i> ) the carriers that are or can be configured as serving cells in the MCG and the SCG are not synchronized. If this field is included, the UE shall also include	
mbms-SCell and mbms-NonServingCell. The field indicates that the UE supports the feature for xDD if mbms-SCell and mbms-NonServingCell are supported for xDD.	
mbms-MaxBW	-
Indicates maximum supported bandwidth (T) for MBMS reception, see TS 36.213 [23]. clause 11.1. If the value is set to <i>implicitValue</i> , the corresponding value of T is calculated as specified in TS 36.213 [23], clause 11.1. If the value is set to <i>explicitValue</i> , the actual value of T = <i>explicitValue</i> * 40 MHz.	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>mbms-NonServingCell</i> Indicates whether the UE in RRC_CONNECTED supports MBMS reception via MRB on a frequency indicated in an <i>MBMSInterestIndication</i> message, where (according to <i>supportedBandCombination</i> and to network synchronization properties) a serving cell may be additionally configured. If this field is included, the UE shall also include the <i>mbms-SCell</i> field.	Yes
<i>mbms-ScalingFactor1dot25, mbms-ScalingFactor7dot5</i> Indicates parameter A ^{(1.25} / A ^{(7.5} , i.e., scaling factor for processing one unit of bandwidth corresponding to subcarrier spacing of 1.25 kHz / 7.5 kHz, with respect to one unit of bandwidth corresponding to subcarrier spacing of 15 kHz. See TS 36.213 [23], clause 11.1. This field is included only if <i>subcarrierSpacingMBMS-khz1dot25 / subcarrierSpacingMBMS-khz7dot5</i> is included. This field shall be included if <i>mbms-MaxBW</i> and <i>subcarrierSpacingMBMS-khz1dot25 / subcarrierSpacingMBMS-khz1dot25 / subcarrierSpacingMBMS-khz1do</i>	-
<i>mbms-SCell</i> Indicates whether the UE in RRC_CONNECTED supports MBMS reception via MRB on a frequency indicated in an <i>MBMSInterestIndication</i> message, when an SCell is configured on that frequency (regardless of whether the SCell is activated or deactivated).	Yes
<i>measurementEnhancements</i> This field defines whether UE supports measurement enhancements in high speed scenario as specified in TS 36.133 [16].	-
<i>measGapPatterns</i> Indicates whether the UE that supports NR supports gap patterns 4 to 11 in LTE standalone as specified in TS 36.133 [16], and for independent measurement gap configuration on FR1 and per-UE gap in (NG)EN-DC as specified in TS 38.133 [84]. The first/ leftmost bit covers pattern 4, and so on. Value 1 indicates that the UE supports the concerned gap pattern.	-
<i>mfbi-UTRA</i> It indicates if the UE supports the signalling requirements of multiple radio frequency bands in a UTRA FDD cell, as defined in TS 25.307 [65].	-
<i>MIMO-BeamformedCapabilityList</i> A list of pairs of {k-Max, n-MaxList} values with the n th entry indicating the values that the UE supports for each CSI process in case n CSI processes would be configured.	No
<i>MIMO-CapabilityDL</i> The number of supported layers for spatial multiplexing in DL. The field may be absent for category 0 and category 1 UE in which case the number of supported layers is 1.	-
<b>MIMO-CapabilityUL</b> The number of supported layers for spatial multiplexing in UL. Absence of the field means that the number of supported layers is 1.	-
<i>MIMO-CA-ParametersPerBoBC</i> A set of MIMO parameters provided per band of a band combination. In case a subfield is absent, the concerned capabilities are the same as indicated at the per UE level (i.e. by MIMO- UE-ParametersPerTM).	-
<i>mimo-CBSR-AdvancedCSI</i> Indicates whether UE supports CBSR for advanced CSI reporting with and without amplitude restriction as defined in TS 36.213 [23], clause 7.2.	-
<i>min-Proc-TimelineSubslot</i> Minimum processing timeline for subslot operation. The minimum processing timeline can belong to one of two sets of associated processing and maximum TA operation. The sets supported can be different for 1os CRS-based SPDCCH, 2os CRS-based SPDCCH and DMRS-based SPDCCH. The sequence applies to: 1. 1os CRS based SPDCCH 2. 2os CRS based SPDCCH 3. DMRS based SPDCCH	-
<i>modifiedMPR-Behavior</i> Field encoded as a bit map, where at least one bit N is set to "1" if UE supports modified MPR/A-MPR behaviour N, see TS 36.101 [42]. All remaining bits of the field are set to "0". The leading / leftmost bit (bit 0) corresponds to modified MPR/A-MPR behaviour 0, the next bit corresponds to modified MPR/A-MPR behaviour 1 and so on. Absence of this field means that UE does not support any modified MPR/A-MPR behaviour.	-
<i>multiACK-CSI-reporting</i> Indicates whether the UE supports multi-cell HARQ ACK and periodic CSI reporting and SR on PUCCH format 3.	Yes
<i>multiBandInfoReport</i> Indicates whether the UE supports the acquisition and reporting of multi band information for <i>reportCGI</i> .	-
multiClusterPUSCH-WithinCC	Yes

multiNS-Pmax         Indicates whether the UE supports the mechanisms defined for cells broadcasting NS- PmaxList           multipleCellMeasExtension         -           indicates whether UE supports numberOfTriggeringCells in the report configuration.         -           multipleTimingAdvance         -           indicates whether the UE supports multiple timing advances for each band combination listed in supportedBandCombination. If the band combination the field indicates that the same or different timing advances on different band entries are supported. If the band combination comprised of one band entry (i.e., intra-band concruous band combination), the field indicates that the same or different timing advances across component carriers of the band entry are supported.           nutlipleUplinkSPS         -           Indicates whether the UE supports multiple uplinkSPS shall also support V2X communication via Uu, as defined in T3 36.300 [9].           must-CapabilityPerBand           Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx.           must-TM89-UpToOneInterferingLayer-r14           Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer.           must-TM89-UpToOneInterferingLayer-r14           Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers.           must-TM10-UpToOneInterferingLayer-r14           Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers.	UE-EUTRA-Capability field descriptions	FDD/ TDD diff
Indicates whether UE supports numberOfTriggeringCells in the report configuration. <i>multipleTimingAdvance</i> Indicates whether the UE supports multiple timing advances for each band combination listed in <i>supportedBandCombination</i> . If the band combination comprised of more than one band entry (i.e., intra-band on-contiguous band combination), the field indicates that the same or different timing advances on different band entries are supported. If the band combination comprised of one band entry (i.e., intra-band contiguous band combination), the field indicates that the same or different timing advances across component carriers of the band entry are supported. <i>multipleUplinkSPS</i> Indicates whether the UE supports multiple uplink SPS and reporting SPS assistance information. A UE indicating <i>multipleUplinkSPS</i> shall also support V2X communication via Uu, as defined in TS 36.300 [9]. <i>must-CapabilityPerBand</i> Indicates that the UE supports MUST, as specified in 36.212 [22], clause 5.3.3.1, on the band in the band combination. <i>must-TM234-UpTo2Tx-r14</i> Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx. <i>must-TM89-UpTOOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer. <i>must-TM10-UpToOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <i>must-TM10-UpToOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer. <i>must-TM10-UpToOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <i>must-TM10-UpToOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <i>must-TM10-UpToOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information fo	dicates whether the UE supports the mechanisms defined for cells broadcasting NS-	-
multipleTimingAdvance           Indicates whether the UE supports multiple timing advances for each band combination listed in supportedBandCombination. If the band combination comprised of more than one band entry (i.e., inter-band or intra-band non-contiguous band combination), the field indicates that the same or different timing advances on different band entries are supported. If the band combination comprised of one band entry (i.e., intra-band contiguous band combination), the field indicates that the same or different timing advances across component carriers of the band entry are supported.           multipleUplinkSPS           Indicates whether the UE supports multiple uplink SPS and reporting SPS assistance information. A UE indicating multipleUplinkSPS shall also support V2X communication via Uu, as defined in TS 36.300 [9].           must-TM23-UpTo2Txr14           Indicates that UE supports MUST as specified in 36.212 [22], clause 5.3.3.1, on the band in the band combination.           must-TM23-UpTo2Txr14           Indicates that UE supports MUST operation for TM2/3/4 using up to 2Tx.           must-TM29-UpTo2Txr14           Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers.           must-TM29-UpTo2ThreeInterferingLayers-r14           Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers.           must-TM10-UpToOnInterferingLayers-r14           Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers.           Indicates that the UE supp		-
Indicates whether the UE supports multiple timing advances for each band combination isted in <i>supportedBandCombination</i> . If the band combination comprised of more than one band entry (i.e., inter-band or intra-band non-contiguous band combination), the field indicates that the same or different timing advances on different band entries are supported. If the band combination comprised of one band entry (i.e., intra-band contiguous band combination), the field indicates that the same or different timing advances across component carriers of the band entry are supported. <b>multipleUplinkSPS</b> Indicates whether the UE supports multipleUplinkSPS shall also support V2X communication via Uu, as defined in TS 36.300 [9]. <b>must-CapabilityPerBand</b> Indicates that UE supports MUST, as specified in 36.212 [22], clause 5.3.3.1, on the band in the band combination. <b>must-TM234-UpTo2Tx+r14</b> Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx. <b>must-TM83-UpTo2Tx+r14</b> Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer. <b>must-TM89-UpTo7neinterferingLayers-r14</b> Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layer. <b>must-TM10-UpToTneeInterferingLayer-r14</b> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <b>must-TM10-UpToToneInterferingLayer-r14</b> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <b>must-TM10-UpToToneInterferingLayer-r14</b> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <b>must-TM10-UpToToneInterferingLayer-r14</b> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <b>must-TM10-UpToToneInterferingLayer-r14</b> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. <b>nu</b>		
Indicates whether the UE supports multiple uplink SPS and reporting SPS assistance information. A UE indicating multipleUplinkSPS shall also support V2X communication via Uu, as defined in TS 36.300 [9]. must-CapabilityPerBand Indicates that UE supports MUST, as specified in 36.212 [22], clause 5.3.3.1, on the band in the band combination. must-TM234-UpTo2Tx-r14 Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx. must-TM89-UpToOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer. must-TM99-UpToOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layer. must-TM10-UpToOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer. must-TM10-UpToOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer. must-TM10-UpToTreeInterferingLayers-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers. maics-Capability-List Indicates that the UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field numberOINAICS-CapableCC indicates the number of Component carriers where the NAICS processing is supported and the field numberOIAggregated/PRB indicates the maximum aggregated bandwidth across these of component carriers where the VAICS processing is supported and the field numberOINAICS-CapableCC, promberOINAICS-CapableCC in the trange (50, 75, 100); For numberOINAICS-CapableCC = 1, UE signals one value for numberOINAICS-CapableCC = 2, UE signals one value for numberOIAggregated/PRB from the range (50, 75, 100, 125, 150, 17	dicates whether the UE supports multiple timing advances for each band combination listed <i>supportedBandCombination</i> . If the band combination comprised of more than one band ntry (i.e., inter-band or intra-band non-contiguous band combination), the field indicates that e same or different timing advances on different band entries are supported. If the band ombination comprised of one band entry (i.e., intra-band contiguous band combination), the eld indicates that the same or different timing advances across component carriers of the and entry are supported.	
Indicates 'that UE supports MUST, as specified in 36.212 [22], clause 5.3.3.1, on the band in the band combination. must-TM23-UpTo2Tx-r14 Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx. must-TM23-UpToOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer. must-TM39-UpTOThreeInterferingLayer-r14 Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers. must-TM10-UpTOOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layers. must-TM10-UpTOThreeInterferingLayer-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layers. must-TM10-UpTOThreeInterferingLayer-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers. maics-Capability-List Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field number01/MAICS-CapableCC indicates the number of component carriers where the NAICS processing is supported and the field number01/Aggregated/PRB indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of (number01/NAICS-CapableCC, e.g. if a UE supports (x CC, y PRBs) and (x-n CC, y-m PRBs) where n>=1 and m>=0, the UE shall indicate both. - For number01/NAICS-CapableCC = 1, UE signals one value for number01/AggregatedPRB from the range (50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300); - For number01/NAICS-CapableCC = 2, UE signals one value for number0	dicates whether the UE supports multiple uplink SPS and reporting SPS assistance formation. A UE indicating <i>multipleUplinkSPS</i> shall also support V2X communication via Uu, s defined in TS 36.300 [9].	-
Indicates that the UE supports MUST operation for TM2/3/4 using up to 2Tx. must-TM89-UpToOneInterferingLayer-r14 Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 1 interfering layer. must-TM89-UpToThreeInterferingLayers-r14 Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers. must-TM10-UpToOneInterferingLayers-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer. must-TM10-UpToThreeInterferingLayers-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layer. must-TM10-UpToThreeInterferingLayers-r14 Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers. naics-Capability-List Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field numberOfIVAICS-CapableCC indicates the number of component carriers where the NAICS processing is supported and the field numberOfAggregatedPRB indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of (numberOfIVAICS-CapableCC, e.g. if a UE supports (x CC, y PRBs) and (x-n CC, y-m PRBs) where n>=1 and m>=0, the UE shall indicate both. • For numberOfIVAICS-CapableCC = 1, UE signals one value for numberOfAggregatedPRB from the range (50, 75, 100, 125, 150, 175, 200); • For numberOfIVAICS-CapableCC = 2, UE signals one value for numberOfAggregatedPRB from the range (50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300); • For numberOfIVAICS-CapableCC = 4, UE signals one value for numberO	dicates that UE supports MUST, as specified in 36.212 [22], clause 5.3.3.1, on the band in e band combination.	-
must-TM89-Up ToOneInterferingLayer-r14         Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to         1 interfering layer.         must-TM89-Up ToThreeInterferingLayers-r14         Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to         3 interfering layers.         must-TM10-Up ToOneInterferingLayer-r14         Indicates that the UE supports MUST operation for TM10 with assistance information for up to         1 interfering layer.         must-TM10-Up ToThreeInterferingLayers-r14         Indicates that the UE supports MUST operation for TM10 with assistance information for up to         3 interfering layers.         mais-Capability-List         Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band         combination. If not present, UE does not support NAICS for any band combination. The field numberOfMAICS-capableCC indicates the number of component carriers where the NAICS         processing is supported and the field numberOfAggregatedPRB indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of (numberOfMAICS-CapableCC, e.g. if a UE supports (& CC, y PRBs) and (x-n CC, y-m PRBs) where n>=1 and m>=0, the UE shall indicate both.         For numberOfMAICS-CapableCC = 1, UE signa		-
must-TM89-UpToThreeInterferingLayers-r14         Indicates that the UE supports MUST operation for TM8/9 with assistance information for up to 3 interfering layers.         must-TM10-UpToOneInterferingLayer-r14         Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer.         must-TM10-UpToThreeInterferingLayers-r14         Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers.         maist-TM10-UpToThreeInterferingLayers-r14         Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support ANICS for any band combination. The field numberOfNAICS-CapableCC indicates the number of component carriers where the NAICS processing is supported and the field numberOfAggregatedPRB indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of (numberOfNAICS-CapableCC, e.g., if a UE supports (x CC, y PRBs) and {x-n CC, y-m PRBs} where n>=1 and m>=0, the UE shall indicate both.         - For numberOfNAICS-CapableCC = 1, UE signals one value for numberOfAggregatedPRB from the range {50, 75, 100, 125, 150, 175, 200};         - For numberOfNAICS-CapableCC = 3, UE signals one value for numberOfAggregatedPRB from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};         - For numberOfNAICS-CapableCC = 4, UE signals one value for numberOfAggregatedPRB from the range	dicates that the UE supports MUST operation for TM8/9 with assistance information for up to	-
<i>must-TM10-UpToOneInterferingLayer-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 1 interfering layer. <i>must-TM10-UpToThreeInterferingLayers-r14</i> Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers. <i>naics-Capability-List</i> Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field <i>numberOfNAICS-CapableCC</i> indicates the number of component carriers where the NAICS processing is supported and the field <i>numberOfAggregatedPRB</i> indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of ( <i>numberOfNAICS-CapableCC</i> , <i>numberOfNAICS-CapableCC</i> ) for every supported <i>numberOfNAICS-CapableCC</i> = 1, UE signals one value for <i>numberOfNAICS-CapableCC</i> = 2, UE signals one value for <i>numberOfNAICS-CapableCC</i> = 3, UE signals one value for <i>numberOfNAICS-CapableCC</i> = 3, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300);         For <i>numberOfNAICS-CapableCC</i> = 4, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 200, 250, 300, 350, 400};       For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 200, 250, 300, 350, 400};       For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 20	dicates that the UE supports MUST operation for TM8/9 with assistance information for up to	-
must-TM10-UpToThreeInterferingLayers-r14         Indicates that the UE supports MUST operation for TM10 with assistance information for up to 3 interfering layers.         naics-Capability-List         Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field numberOfNAICS-CapableCC indicates the number of component carriers where the NAICS processing is supported and the field numberOfAggregatedPRB indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of (numberOfNAICS-CapableCC, e.g. if a UE supports {x CC, y PRBs} and {x-n CC, y-m PRBs} where n>=1 and m>=0, the UE shall indicate both.         -       For numberOfNAICS-CapableCC = 1, UE signals one value for numberOfAggregatedPRB from the range {50, 75, 100};         -       For numberOfNAICS-CapableCC = 2, UE signals one value for numberOfAggregatedPRB from the range {50, 75, 100, 125, 150, 175, 200};         -       For numberOfNAICS-CapableCC = 3, UE signals one value for numberOfAggregatedPRB from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};         -       For numberOfNAICS-CapableCC = 4, UE signals one value for numberOfAggregatedPRB from the range {50, 100, 150, 200, 250, 300, 350, 400};         -       For numberOfNAICS-CapableCC = 5, UE signals one value for numberOfAggregatedPRB from the range {50, 100, 150, 200, 250, 300, 350, 400};	dicates that the UE supports MUST operation for TM10 with assistance information for up to	-
<ul> <li><i>naics-Capability-List</i> <ul> <li>Indicates that UE supports NAICS, i.e. receiving assistance information from serving cell and using it to cancel or suppress interference of neighbouring cell(s) for at least one band combination. If not present, UE does not support NAICS for any band combination. The field <i>numberOfNAICS-CapableCC</i> indicates the number of component carriers where the NAICS processing is supported and the field <i>numberOfAggregatedPRB</i> indicates the maximum aggregated bandwidth across these of component carriers (expressed as a number of PRBs) with the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall indicate the combination of {<i>numberOfNAICS-CapableCC</i>, e.g. if a UE supports {x CC, y PRBs} and {x-n CC, y-m PRBs} where n&gt;=1 and m&gt;=0, the UE shall indicate both.</li> <li>For <i>numberOfNAICS-CapableCC</i> = 1, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 3, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 4, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 200, 250, 300, 350, 400};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 200, 250, 300, 350, 400};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 200, 250, 300, 350, 400};</li> <li>For <i>numberOfNAICS-Capa</i></li></ul></li></ul>	dicates that the UE supports MUST operation for TM10 with assistance information for up to	-
Indicates whether the UE supports measurement NCSG Pattern Id 0, 1, 2 and 3, as specified in TS 36.133 [16]. If this field is included and the UE supports asynchronous DC, the UE shall	<ul> <li>aics-Capability-List</li> <li>dicates that UE supports NAICS, i.e. receiving assistance information from serving cell and sing it to cancel or suppress interference of neighbouring cell(s) for at least one band ombination. If not present, UE does not support NAICS for any band combination. The field <i>umberOfNAICS-CapableCC</i> indicates the number of component carriers where the NAICS rocessing is supported and the field <i>numberOfAggregatedPRB</i> indicates the maximum ggregated bandwidth across these of component carriers (expressed as a number of PRBs) ith the restriction that NAICS is only supported over the full carrier bandwidth. The UE shall dicate the combination of <i>{numberOfNAICS-CapableCC</i>, e.g. if a UE supports {x CC, y PRBs} and {x-n C, y-m PRBs} where n&gt;=1 and m&gt;=0, the UE shall indicate both.</li> <li>For <i>numberOfNAICS-CapableCC</i> = 1, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 2, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 4, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 4, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 4, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 175, 200, 225, 250, 275, 300};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 75, 100, 125, 150, 300, 350, 400};</li> <li>For <i>numberOfNAICS-CapableCC</i> = 5, UE signals one value for <i>numberOfAggregatedPRB</i> from the range {50, 100, 150, 200, 250, 300, 350, 400};</li> </ul>	No
asynchronous DC, only NCSG Pattern Id 0 and 1 shall be supported	<i>csg</i> dicates whether the UE supports measurement NCSG Pattern Id 0, 1, 2 and 3, as specified TS 36.133 [16]. If this field is included and the UE supports asynchronous DC, the UE shall upport NCSG Pattern Id 0, 1, 2 and 3. If this field is included but the UE does not support	No
ng-EN-DC Indicates whether the UE supports NGEN-DC.		-

n-MaxList (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the maximum number of NZP CSI RS ports       supported within a CSI process applicable for band combinations for which the concerned         capabilities are not signalled. For k-Max values exceeding 1, the UE shall include the field and       signal k-Max minus 1 bits. The first bit indicates n-Max2, with value 0 indicating 8 and value 1         indicating 16. The second bit indicates n-Max3, with value 0 indicating 32. The fifth bit       indicates n-Max4, with value 0 indicating 32. The fifth bit         fourth bit indicates n-Max4, with value 0 indicating 32. The sixt bit indicates n-Max6, with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates n-Max7, with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates n-Max7, with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates n-Max8, with value 0 indicating 16 and value 1 indicating 64.       No         restrict (in MIMO-CA-ParametersPerBoBCPerTM)       No         If signalled, the field indicates for a particular transmission mode the maximum number of NZP       No         Softs supported within a CSI process applicable for band the concerned combination.       No         Purther details are as indicated for n-MaxList in MIMO-UE-ParametersPerTM.       No         NonContiguousUL-RA-WithinCC-List       No         NonContiguousUL-RA-WithinCC-List       No         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       FD-MIMO operation (class	UE-EUTRA-Capability field descriptions	FDD/ TDD diff
supported within a CSI process applicable for band combinations for which the concerned capabilities are not signalled. For <i>k-Max</i> values exceeding 1, the UE shall include the field and signal <i>k-Max</i> minus 1 bits. The first bit indicates <i>n-Max2</i> , with value 0 indicating 8 and value 1 indicating 16. The second bit indicates <i>n-Max3</i> , with value 0 indicating 3 and value 1 indicating 16. The third bit indicates <i>n-Max4</i> , with value 0 indicating 8 and value 1 indicating 32. The fourth bit indicates <i>n-Max5</i> , with value 0 indicating 16 and value 1 indicating 32. The fifth bit indicates <i>n-Max6</i> , with value 0 indicating 16 and value 1 indicating 32. The fifth bit indicates <i>n-Max6</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 32. The seventh bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 64. <i>n-MaxList (in MIMO-CA-ParametersPerBoBCPerTM)</i> If signalled, the field indicates for a particular transmission mode the maximum number of NZP CSI RS ports supported within a CSI process applicable for band the concerned combination. Further details are as indicated for <i>n-MaxList</i> in <i>MIMO-UE-ParametersPerTM</i> . No One entry corresponding to each supported E-UTRA band listed in the same order as in <i>supportedBandListEUTRA</i> . <i>nonPrecoded (in MIMO-UE-ParametersPerBoBCPerTM</i> , and the FD-MIMO processing capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> . MIND operation (class A) for band combinations for which the concerned capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> . MIND processing capability condition as described in NOTE 8 is satisfied. <i>nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM</i> ) If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned EBF/ FD-MIMO oper		TBD
capabilities are not signalled. For <i>k-Max</i> values exceeding 1, the UE shall include the field and signal <i>k-Max</i> minus 1 bits. The first bit indicates <i>n-Max2</i> , with value 0 indicating 8 and value 1 indicating 16. The second bit indicates <i>n-Max3</i> , with value 0 indicating 8 and value 1 indicating 16. The second bit indicates <i>n-Max3</i> , with value 0 indicating 8 and value 1 indicating 32. The first bit indicates <i>n-Max4</i> , with value 0 indicating 16 and value 1 indicating 32. The fourth bit indicates <i>n-Max6</i> , with value 0 indicating 16 and value 1 indicating 32. The fifth bit indicates <i>n-Max6</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max8</i> , 		
indicating 16. The second bit indicates <i>n-Max3</i> , with value 0 indicating 8 and value 1 indicating 16. The third bit indicates <i>n-Max4</i> , with value 0 indicating 8 and value 1 indicating 32. The fourth bit indicates <i>n-Max5</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max6</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 32. The sixt bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 32. The seventh bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 32. The seventh bit indicates <i>n-Max8</i> , with value 0 indicating 16 and value 1 indicating 64. <i>n-MaxList (in MIMO-CA-ParametersPerBoBCPerTM)</i> NoIf signalled, the field indicates for a particular transmission mode the maximum number of NZP CSI RS ports supported within a CSI process applicable for band the concerned combination. Further details are as indicated for <i>n-MaxList</i> in <i>MIMO-UE-ParametersPerTM</i> .NoNonContiguousUL-RA-WithinCC-List One entry corresponding to each supported E-UTRA band listed in the same order as in <i>supportedBandListEUTRA</i> .NononPrecoded (in MIMO-UE-ParametersPerTM) Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> , and the FD-MIMO processing capability condition as described in NOTE 8 is satisfiednonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM) If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned-	capabilities are not signalled. For <i>k-Max</i> values exceeding 1, the UE shall include the field and	
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Max7, with value 0 indicating 16 and value 1 indicating 32. The seventh bit indicates n-Max8, with value 0 indicating 16 and value 1 indicating 64.       No         n-MaxList (in MIMO-CA-ParametersPerBoBCPerTM)       No         If signalled, the field indicates for a particular transmission mode the maximum number of NZP CSI RS ports supported within a CSI process applicable for band the concerned combination.       No         Further details are as indicated for n-MaxList in MIMO-UE-ParametersPerTM.       No         NonContiguousUL-RA-WithinCC-List       No         One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.       No         nonPrecoded (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       TBD         FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in MIMO-CA-ParametersPerBoBCPerTM, and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied.       -         nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned capabilities concerned       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned       -		
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<i>n-MaxList (in MIMO-CA-ParametersPerBoBCPerTM)</i> No         If signalled, the field indicates for a particular transmission mode the maximum number of NZP       NZP         CSI RS ports supported within a CSI process applicable for band the concerned combination.       Further details are as indicated for <i>n-MaxList</i> in <i>MIMO-UE-ParametersPerTM</i> .         NonContiguousUL-RA-WithinCC-List       No         One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.       No         nonPrecoded (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       TBD         FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> , and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied.       -         nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)       -       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned       -		
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Further details are as indicated for <i>n-MaxList</i> in <i>MIMO-UE-ParametersPerTM</i> .       No         NonContiguousUL-RA-WithinCC-List       No         One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.       No         nonPrecoded (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       TBD         FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> , and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied.       -         nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)       -       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned       -	If signalled, the field indicates for a particular transmission mode the maximum number of NZP	
NonContiguousUL-RA-WithinCC-List       No         One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.       No         nonPrecoded (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       TBD         FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in MIMO-CA-ParametersPerBoBCPerTM, and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied.       -         nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)       -       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned       -		
One entry corresponding to each supported E-UTRA band listed in the same order as in supportedBandListEUTRA.       TBD         nonPrecoded (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in MIMO-CA-ParametersPerBoBCPerTM, and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied.       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerned EBF/FD-MIMO operation (class A) applicable for the concerned       -		
supportedBandListEUTRA.       TBD         nonPrecoded (in MIMO-UE-ParametersPerTM)       TBD         Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/       FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in MIMO-CA-ParametersPerBoBCPerTM, and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied.       -         nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)       -       -         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned       -	5	No
Indicates for a particular transmission mode the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) for band combinations for which the concerned capabilities are not signalled in <i>MIMO-CA-ParametersPerBoBCPerTM</i> , and the FD-MIMO processing capability condition as described in NOTE 8 is satisfied. <i>nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)</i> If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned		
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not signalled in MIMO-CA-ParametersPerBoBCPerTM, and the FD-MIMO processing         capability condition as described in NOTE 8 is satisfied.         nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)         If signalled, the field indicates for a particular transmission mode, the UE capabilities         concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned		
capability condition as described in NOTE 8 is satisfied.       nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)         If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned       -		
nonPrecoded (in MIMO-CA-ParametersPerBoBCPerTM)         -           If signalled, the field indicates for a particular transmission mode, the UE capabilities         -           concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned         -		
If signalled, the field indicates for a particular transmission mode, the UE capabilities concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned		
concerning non-precoded EBF/ FD-MIMO operation (class A) applicable for the concerned		-
	band combination.	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>nonUniformGap</i> Indicates whether the UE supports measurement non uniform Pattern Id 1, 2, 3 and 4 in LTE standalone as specified in TS 36.133 [16].	No
noResourceRestrictionForTTIBundling Indicate whether the UE supports TTI bundling operation without resource allocation restriction.	No
nonCSG-SI-Reporting Indicates whether UE will report PLMN list from non-CSG cells.	-
numberOfBlindDecodesUSS Indicates the maximum number of blind decodes in UE specific search space in one subframe for CCs configured with sTTI operation supported by the UE. The number of blind decodes supported by the UE is the field value X*68. Field value ranges from 4 to 32.	-
<i>otdoa-UE-Assisted</i> Indicates whether the UE supports UE-assisted OTDOA positioning, as specified in TS 36.355 [54].	Yes
outOfOrderDelivery Same as "outOfOrderDelivery" defined in TS 38.306 [87].	No
outOfSequenceGrantHandling Indicates whether the UE supports PUSCH transmissions with out of sequence UL grants as defined in TS 36.213 [22]. This field can be included only if uplinkLAA is included.	-
overheatingInd Indicates whether the UE supports overheating assistance information.	No
<i>pdcch-CandidateReductions</i> Indicates whether the UE supports PDCCH candidate reduction on UE specific search space as specified in TS 36.213 [23], clause 9.1.1.	No
pdcp-Duplication Indicates whether the UE supports PDCP duplication.	-
<i>pdcp-SN-Extension</i> Indicates whether the UE supports 15 bit length of PDCP sequence number.	-
<i>pdcp-SN-Extension-18bits</i> Indicates whether the UE supports 18 bit length of PDCP sequence number.	-
<i>pdcp-TransferSplitUL</i> Indicates whether the UE supports PDCP data transfer split in UL for the <i>drb-TypeSplit</i> as specified in TS 36.323 [8].	-
<i>pdsch-CollisionHandling</i> Indicates whether the UE supports PDSCH collision handling as specified in TS 36.213 [23].	No
pdsch-RepSubframe Indicates whether the UE supports subframe PDSCH repetition.	-
pdsch-RepSlot Indicates whether the UE supports slot PDSCH repetition.	-
<i>pdsch-RepSubslot</i> Indicates whether the UE supports subslot PDSCH repetition. This field is only applicable for UEs supporting FDD.	-
<i>pdsch-SlotSubslotPDSCH-Decoding</i> Indicates whether the UE supports decoding of PDSCH and slot-PDSCH/subslot-PDSCH assigned with C-RNTI/SPS C-RNTI in the same subframe for a given carrier.	-
<i>perServingCellMeasurementGap</i> Indicates whether the UE supports per serving cell measurement gap indication, as specified in TS 36.133 [16].	-
<i>phy-TDD-ReConfig-FDD-PCell</i> Indicates whether the UE supports TDD UL/DL reconfiguration for TDD serving cell(s) via monitoring PDCCH with eIMTA-RNTI on a FDD PCell, and HARQ feedback according to UL and DL HARQ reference configurations. This bit can only be set to supported only if the UE supports FDD PCell and <i>phy-TDD-ReConfig-TDD-PCell</i> is set to supported.	No
<i>phy-TDD-ReConfig-TDD-PCell</i> Indicates whether the UE supports TDD UL/DL reconfiguration for TDD serving cell(s) via monitoring PDCCH with eIMTA-RNTI on a TDD PCell, and HARQ feedback according to UL and DL HARQ reference configurations, and PUCCH format 3.	Yes
pmi-Disabling powerClass-14dBm	Yes -
Indicates whether the UE supports power class 14 dBm when operating in CE mode A or B for all the bands that are supported by the UE, as specified in TS 36.101 [42].	_
powerPrefInd Indicates whether the UE supports power preference indication.	No

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<b>powerUCI-SlotPUSCH, powerUCI-SubslotPUSCH</b> Indicates whether the UE supports BPRE derivation based on the actual derived O_CQI. The parameter <i>uplinkPower-CSIPayload</i> configures the UE to derive BPRE based on either the actual value of O_CQI or the largest value of O_CQI across all RI values. If the UE does not support the capability, the UE will derive BPRE based on the largest value of O_CQI across all RI values.	-
<i>prach-Enhancements</i> This field defines whether the UE supports random access preambles generated from restricted set type B in high speed scenoario as specified in TS 36.211 [21].	-
<b>processingTimelineSet</b> Indicates, for each SPDCCH configuration, support for a set of TA values. Each set consists of two different processing timelines and associated maximum TA. Set 1 indicates support for n+4 and n+6 and set 2 indicates support for n+6 and n+8, see TS 36.211 [21], clause 8.1, The minimum processing timeline to use, out of the two options for a given set is configured by parameter <i>proc-Timeline</i> . Support of Set 1 implicitly means support of Set 2.	-
<i>pucch-Format4</i> Indicates whether the UE supports PUCCH format 4.	Yes
pucch-Format5 Indicates whether the UE supports PUCCH format 5.	Yes
<i>pucch-SCell</i> Indicates whether the UE supports PUCCH on SCell.	No
<i>pusch-Enhancements</i> Indicates whether the UE supports the PUSCH enhancement mode as specified in TS 36.211 [21] and TS 36.213 [23].	Yes
<i>pusch-FeedbackMode</i> Indicates whether the UE supports PUSCH feedback mode 3-2.	No
pusch-SPS-MaxConfigSlot	-
Indicates the max number of SPS configurations across all cells for slot PUSCH.  pusch-SPS-MultiConfigSlot  Indicates the number of multiple SPS configurations of slot PUSCH for each conting cell	-
Indicates the number of multiple SPS configurations of slot PUSCH for each serving cell. pusch-SPS-MaxConfigSubframe	-
Indicates the max number of SPS configurations across all cells for subframe PUSCH. pusch-SPS-MultiConfigSubframe	-
Indicates the number of multiple SPS configurations of subframe PUSCH for each serving cell. <i>pusch-SPS-MaxConfigSubslot</i>	-
Indicates the max number of SPS configurations across all cells for subslot PUSCH. pusch-SPS-MultiConfigSubslot	
Indicates the number of multiple SPS configurations of subslot PUSCH for each serving cell. This field is only applicable for UEs supporting FDD.	
pusch-SPS-SlotRepPCell Indicates whether the UE supports SPS repetition for slot PUSCH for PCell.	-
<i>pusch-SPS-SlotRepPSCell</i> Indicates whether the UE supports SPS repetition for slot PUSCH for PSCell.	-
<i>pusch-SPS-SlotRepSCell</i> Indicates whether the UE supports SPS repetition for slot PUSCH for serving cells other than SpCell.	-
pusch-SPS-SubframeRepPCell Indicates whether the UE supports SPS repetition for subframe PUSCH for PCell.	-
pusch-SPS-SubframeRepPSCell Indicates whether the UE supports SPS repetition for subframe PUSCH for PSCell.	-
<i>pusch-SPS-SubframeRepSCell</i> Indicates whether the UE supports SPS repetition for subframe PUSCH for serving cells other than SpCell.	-
<i>pusch-SPS-SubslotRepPCell</i> Indicates whether the UE supports SPS repetition for subslot PUSCH for PCell. This field is only applicable for UEs supporting FDD.	-
<i>pusch-SPS-SubslotRepPSCell</i> Indicates whether the UE supports SPS repetition for subslot PUSCH for PSCell. This field is only applicable for UEs supporting FDD.	-
<i>pusch-SPS-SubslotRepSCell</i> Indicates whether the UE supports SPS repetition for subslot PUSCH for serving cells other than SpCell. This field is only applicable for UEs supporting FDD.	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
pusch-SRS-PowerControl-SubframeSet	Yes
Indicates whether the UE supports subframe set dependent UL power control for PUSCH and SRS. This field is only applicable for UEs supporting TDD.	
qcI-CRI-BasedCSI-Reporting	-
Indicates whether the UE supports CRI based CSI feedback for the FeCoMP feature as specified in TS 36.213 [23], clause 7.1.10.	
qcl-TypeC-Operation	-
The UE uses this field to indicate the support of all of the following three features: QCL Type-C operation for FeCoMP, the capability to support separate PDSCH RE mapping for different PDSCH CWs in non-coherent joint transmission and the capability to support handling new DMRS port to MIMO layer mapping for the CWs, as specified in TS 36.213 [23], clause 7.1.10.	
<i>qoe-MeasReport</i> Indicates whether the UE supports QoE Measurement Collection for streaming services.	-
qoe-MTSI-MeasReport	
Indicates whether the UE supports QoE Measurement Collection for MTSI services.	
<i>rach-Less</i> Indicates whether the UE supports RACH-less handover, and whether the UE which indicates <i>dc-Parameters</i> supports RACH-less SeNB change, as defined in TS 36.300 [9].	-
rach-Report	-
Indicates whether the UE supports delivery of rachReport.	
<i>rai-Support</i> Defines whether the UE supports release assistance indication (RAI) as specified in TS 36.321 [6] for BL UEs.	No
rclwi	
Indicates whether the UE supports RCLWI, i.e. reception of <i>rclwi-Configuration</i> . The UE which supports RLCWI shall also indicate support of <i>interRAT-ParametersWLAN-r13</i> . The UE which supports RCLWI and <i>wlan-IW-RAN-Rules</i> shall also support applying WLAN identifiers received in <i>rclwi-Configuration</i> for the access network selection and traffic steering rules when in RRC_IDLE.	
recommendedBitRate	No
Indicates whether the UE supports the bit rate recommendation message from the eNB to the UE as specified in TS 36.321 [6], clause 6.1.3.13.	NU
recommendedBitRateQuery	No
Indicates whether the UE supports the bit rate recommendation query message from the UE to the eNB as specified in TS 36.321 [6], clause 6.1.3.13. If this field is included, the UE shall also include the <i>recommendedBitRate</i> field.	
reducedCP-Latency	Yes
Indicates whether the UE supports reduced CP latency.	
<i>reducedIntNonContComb</i> Indicates whether the UE supports receiving <i>requestReducedIntNonContComb</i> that requests the UE to exclude supported intra-band non-contiguous CA band combinations other than included in capability signalling as specified in TS 36.306 [5], clause 4.3.5.21.	-
<i>reducedIntNonContCombRequested</i> Indicates that the UE excluded supported intra-band non-contiguous CA band combinations other than included in capability signalling as specified in TS 36.306 [5,] clause 4.3.5.21.	-
reflectiveQoS	No
Indicates whether the UE supports AS reflective QoS.	
<i>relWeightTwoLayers/ relWeightFourLayers/ relWeightEightLayers</i> Indicates relative weight of processing FD-MIMO with 2/ 4/ 8 layers with respect to non-FD-MIMO with the same number of layers, see NOTE 8. Value v1 corresponds to relative weight of 1, value v1dot25 corresponds to relative weight of 1.25 and so on. This field can be included only if the UE supports the corresponding number of layers (i.e., 2/ 4/ 8 layers).	-
reportCGI-NR-EN-DC Indicates whether the UE supports Inter-RAT report CGI procedure towards NR cell when it is	Yes
configured with (NG)EN-DC. reportCGI-NR-NoEN-DC Indicates whether the UE supports Inter-RAT report CGI procedure towards NR cell when it is	Yes

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<ul> <li>srs-CapabilityPerBandPairList</li> <li>Indicates, for a particular pair of bands, the SRS carrier switching parameters when switching between the band pair to transmit SRS on a PUSCH-less SCell as specified in 36.212 [22] and 36.213 [23]. If included, the UE shall include a number of entries as indicated in the following, and listed in the same order, as in <i>bandParameterList</i> for the concerned band combination:         <ul> <li>For the first band, the UE shall include the same number of entries as in <i>bandParameterList</i> i.e. first entry corresponds to first band in <i>bandParameterList</i> and so</li> </ul> </li> </ul>	-
<ul> <li>on,</li> <li>For the second band, the UE shall include one entry less i.e. first entry corresponds to the second band in <i>bandParameterList</i> and so on</li> <li>And so on.</li> </ul>	
requestedBands Indicates the frequency bands requested by E-UTRAN.	-
requestedCCsDL, requestedCCsUL	-
Indicates the maximum number of CCs requested by E-UTRAN. requestedDiffFallbackCombList Indicates the CA band combinations for which report of different UE capabilities is requested by E-UTRAN.	-
<b>rf-RetuningTimeDL</b> Indicates the interruption time on DL reception within a band pair during the RF retuning for switching between the band pair to transmit SRS on a PUSCH-less SCell. n0 represents 0 OFDM symbols, n0dot5 represents 0.5 OFDM symbols, n1 represents 1 OFDM symbol and so on. This field is mandatory present if switching between the band pair is supported.	-
<i>rf-RetuningTimeUL</i> Indicates the interruption time on UL transmission within a band pair during the RF retuning for switching between the band pair to transmit SRS on a PUSCH-less SCell. n0 represents 0 OFDM symbols, n0dot5 represents 0.5 OFDM symbols, n1 represents 1 OFDM symbol and so on. This field is mandatory present if switching between the band pair is supported.	-
<i>rlc-AM-Ooo-Delivery</i> Indicates whether the UE supports out-of-order delivery from RLC to PDCP for RLC AM.	-
<i>rlc-UM-Ooo-Delivery</i> Indicates whether the UE supports out-of-order delivery from RLC to PDCP for RLC UM.	-
<i>rIm-ReportSupport</i> Indicates whether the UE supports RLM event and information reporting.	-
rohc-ContextContinue	No
Same as "continueROHC-Context" defined in TS 38.306 [87]. rohc-ContextMaxSessions	No
Same as "maxNumberROHC-ContextSessions" defined in TS 38.306 [87]. rohc-Profiles	No
Same as "supportedROHC-Profiles" defined in TS 38.306 [87]. rohc-ProfilesUL-Only Same as "unlinkOnlyROHC Profiles" defined in TS 28 206 [87]	No
Same as "uplinkOnlyROHC-Profiles" defined in TS 38.306 [87]. rsrqMeasWideband	Yes
Indicates whether the UE can perform RSRQ measurements with wider bandwidth. <i>rsrq-OnAllSymbols</i> Indicates whether the UE can perform RSRQ measurement on all OFDM symbols and also support the extended RSRQ upper value range from -3dB to 2.5dB in measurement configuration and rescribed in TO 20 422 442	No
configuration and reporting as specified in TS 36.133 [16]. <i>rs-SINR-Meas</i> Indicates whether the UE can perform RS-SINR measurements in RRC_CONNECTED as specified in TS 36.214 [48].	-
rssi-AndChannelOccupancyReporting Indicates whether the UE supports performing measurements and reporting of RSSI and channel occupancy. This field can be included only if <i>downlinkLAA</i> is included.	-
sa-NR Indicates whether the UE supports standalone NR as specified in TS 38.331 [82].	No
scptm-AsyncDC Indicates whether the UE in RRC_CONNECTED supports MBMS reception via SC-MRB on a frequency indicated in an <i>MBMSInterestIndication</i> message, where (according to <i>supportedBandCombination</i> ) the carriers that are or can be configured as serving cells in the MCG and the SCG are not synchronized. If this field is included, the UE shall also include <i>scptm-SCell</i> and <i>scptm-NonServingCell</i> .	Yes

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
scptm-NonServingCell Indicates whether the UE in RRC_CONNECTED supports MBMS reception via SC-MRB on a frequency indicated in an <i>MBMSInterestIndication</i> message, where (according to supportedBandCombination and to network synchronization properties) a serving cell may be additionally configured. If this field is included, the UE shall also include the scptm-SCell field.	Yes
<i>scptm-Parameters</i> Presence of the field indicates that the UE supports SC-PTM reception as specified in TS 36.306 [5].	Yes
scptm-SCell Indicates whether the UE in RRC_CONNECTED supports MBMS reception via SC-MRB on a frequency indicated in an MBMSInterestIndication message, when an SCell is configured on that frequency (regardless of whether the SCell is activated or deactivated).	Yes
scptm-ParallelReception Indicates whether the UE in RRC_CONNECTED supports parallel reception in the same subframe of DL-SCH transport blocks transmitted using C-RNTI/Semi-Persistent Scheduling C- RNTI and using SC-RNTI/G-RNTI as specified in TS 36.306 [5].	Yes
secondSlotStartingPosition Indicates whether the UE supports reception of subframes with second slot starting position as described in TS 36.211 [21] and TS 36.213 [23]. This field can be included only if <i>downlinkLAA</i> is included.	-
<i>semiOL</i> Indicates whether the UE supports semi-open-loop transmission for the indicated transmission mode.	FFS
semiStaticCFI Indicates whether the UE supports the semi-static configuration of CFI for subframe/slot/sub- slot operation.	-
semiStaticCFI-Pattern Indicates whether the UE supports the semi-static configuration of CFI pattern for subframe/slot/sub-slot operation. This field is only applicable for UEs supporting TDD.	-
shortCQI-ForSCellActivation Indicates whether the UE supports additional CQI reporting periodicity after SCell activation.	-
shortMeasurementGap Indicates whether the UE supports shorter measurement gap length (i.e. <i>gp2</i> and <i>gp3</i> ) in LTE standalone as specified in TS 36.133 [16], and for independent measurement gap configuration on FR1 and per-UE gap in (NG)EN-DC as specified in TS38.133 [84].	No
shortSPS-IntervalFDD Indicates whether the UE supports uplink SPS intervals shorter than 10 subframes in FDD mode.	-
shortSPS-IntervalTDD Indicates whether the UE supports uplink SPS intervals shorter than 10 subframes in TDD mode.	-
simultaneousPUCCH-PUSCH Indicates whether the UE supports simultaneous transmission of PUSCH/PUCCH and SlotOrSubslotPUSCH/SPUCCH (if supported).	Yes
<i>simultaneousRx-Tx</i> Indicates whether the UE supports simultaneous reception and transmission on different bands for each band combination listed in <i>supportedBandCombination</i> . This field is only applicable for inter-band TDD band combinations. A UE indicating support of <i>simultaneousRx-Tx</i> and <i>dc-</i> <i>Support-r12</i> shall support different UL/DL configurations between PCell and PSCell.	-
<i>simultaneousTx-DifferentTx-Duration</i> Indicates whether the UE supports simultaneous transmission of different transmission durations over different carriers. The different transmission durations can be of subframe, slot or subslot duration.	-
<i>skipFallbackCombinations</i> Indicates whether UE supports receiving reception of <i>requestSkipFallbackComb</i> that requests UE to exclude fallback band combinations from capability signalling.	-
skipFallbackCombRequested Indicates whether requestSkipFallbackComb is requested by E-UTRAN.	-
skipMonitoringDCI-Format0-1A Indicates whether UE supports blind decoding reduction on UE specific search space by not monitoring DCI Format 0 and 1A as specified in TS 36.213 [23], clause 9.1.1.	No

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>skipSubframeProcessing</i> This fields defines whether the UE supports aborting reception of PDSCH if the UE receives slot-PDSCH/subslot-PDSCH during an ongoing PDSCH reception and instead starts receiving the slot-PDSCH/subslot-PDSCH, as well as whether the UE supports aborting a PUSCH transmission if the UE gets a grant for a slot-PUSCH/ subslot-PUSCH transmission that overlaps with a grant received for a PUSCH transmission. The capability indicates the number of subframes that the UE may drop prior to the subframe in which it prioritizes the processing of slot/subslot PDSCH/PUSCH as described in TS 36.213 [23], clauses 7.1 and 8.0. Separate capability for UL and DL and per sTTI length in each direction: <i>skipProcessingUL-Slot,</i> <i>skipProcessingDL-Subslot, skipProcessingUL-Slot</i> and <i>skipProcessingUL-Subslot</i> .	
<i>skipUplinkDynamic</i> Indicates whether the UE supports skipping of UL transmission for an uplink grant indicated on PDCCH if no data is available for transmission as described in TS 36.321 [6].	-
<i>skipUplinkSPS</i> Indicates whether the UE supports skipping of UL transmission for a configured uplink grant if no data is available for transmission as described in TS 36.321 [6].	-
<i>sI-64QAM-Rx</i> Indicates whether the UE supports 64QAM for the reception of V2X sidelink communication.	-
<i>sI-64QAM-Tx</i> Indicates whether the UE supports 64QAM for the transmission of V2X sidelink communication.	-
<i>sl-CongestionControl</i> Indicates whether the UE supports Channel Busy Ratio measurement and reporting of Channel Busy Ratio measurement results to eNB for V2X sidelink communication.	-
<i>sI-LowT2min</i> Indicates whether the UE supports 10ms as minimum value of T2 for resource selection procedure of V2X sidelink communication.	-
sI-RateMatchingTBSScaling Indicates whether the UE supports rate matching and TBS scalling for V2X sidelink communication.	-
<i>slotPDSCH-TxDiv-TM8</i> Indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM8 for slot PDSCH.	
<i>slotPDSCH-TxDiv-TM9and10</i> Indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM9/10 for slot PDSCH.	
slss-SupportedTxFreq Indicates whether the UE supports the SLSS transmission on single carrier or on multiple carriers in the case of sidelink carrier aggregation.	-
<i>sIss-TxRx</i> Indicates whether the UE supports SLSS/PSBCH transmission and reception in UE autonomous resource selection mode and eNB scheduled mode in a band for V2X sidelink communication.	-
<i>sI-TxDiversity</i> Indicates whether the UE supports transmit diversity for V2X sidelink communication. See TS 36.101 [42].	-
sn-SizeLo Same as "shortSN" defined in TS 38.306 [87].	No
spatialBundling-HARQ-ACK Indicates whether UE supports HARQ-ACK spatial bundling on PUCCH or PUSCH as specified in TS 36.213 [23], clauses 7.3.1 and 7.3.2.	No
spdcch-differentRS-types indicates whether the UE supports monitoring of sPDCCH on RB sets with different RS types within a TTI.	-
spdcch-Reuse Indicates whether the UE supports L1 based SPDCCH reuse.	-
<b>sps-CyclicShift</b> ndicates whether the UE supports RRC configuration of cyclic shift for DMRS for UL SPS using 1ms TTI.	-
<b>sps-ServingCell</b> Indicates whether the UE supports multiple UL/DL SPS configurations simultaneously active on different serving cells as specified in TS 36.321 [6].	-
<i>sps-STTI</i> Indicates whether the UE supports SPS in DL and/or UL for slot or subslot based PDSCH and PUSCH, respectively.	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
srs-DCI7-TriggeringFS2 Indicates whether the UE supports SRS triggerring via DCI format 7 for FS2.	-
srs-Enhancements	TBD
Indicates whether the UE supports SRS enhancements.	
srs-EnhancementsTDD Indicates whether the UE supports TDD specific SRS enhancements.	Yes
srs-FlexibleTiming	
Indicates whether the UE supports configuration of <i>soundingRS-FlexibleTiming-r14</i> for the corresponding band pair. For a TDD-TDD band pair, UE shall include at least one of <i>srs-FlexibleTiming</i> and/or <i>srs-HARQ-ReferenceConfig</i> when <i>rf-RetuningTimeDL</i> or <i>rf-RetuningTimeUL</i> corresponding to the band pair is larger than 1 OFDM symbol.	
srs-HARQ-ReferenceConfig Indicates whether the UE supports configuration of <i>harq-ReferenceConfig-r14</i> for the corresponding band pair. For a TDD-TDD band pair, UE shall include at least one of <i>srs-</i> <i>FlexibleTiming</i> and/or <i>srs-HARQ-ReferenceConfig</i> when <i>rf-RetuningTimeDL</i> or <i>rf-</i> <i>RetuningTimeUL</i> corresponding to the band pair is larger than 1 OFDM symbol.	-
srs-MaxSimultaneousCCs	-
Indicates the maximum number of simultaneously configurable target CCs for SRS switching (i.e., CCs for which srs-SwitchFromServCellIndex is configured) supported by the UE.	
srs-UpPTS-6sym	-
Indicates whether the UE supports up to 6-symbol SRS in UpPTS. srvcc-FromUTRA-FDD-ToGERAN	
Indicates whether UE supports SRVCC handover from UTRA FDD PS HS to GERAN CS.	-
srvcc-FromUTRA-FDD-ToUTRA-FDD	-
Indicates whether UE supports SRVCC handover from UTRA FDD PS HS to UTRA FDD CS.	
srvcc-FromUTRA-TDD128-ToGERAN Indicates whether UE supports SRVCC handover from UTRA TDD 1.28Mcps PS HS to GERAN CS.	-
srvcc-FromUTRA-TDD128-ToUTRA-TDD128 Indicates whether UE supports SRVCC handover from UTRA TDD 1.28Mcps PS HS to UTRA TDD 1.28Mcps CS.	-
ss-CCH-InterfHandI Indicates whether the UE supports synchronisation signal and common channel interference handling.	Yes
ss-SINR-Meas-NR-FR1, ss-SINR-Meas-NR-FR2 Indicates whether the UE can perform NR SS-SINR measurement for a frequency range (i.e. FR1 or FR2) as specified in TS 38.215 [89].	-
ssp10-TDD-Only Indicates the UE supports special subframe configuration 10 when operating only in TDD carriers (i.e., not in TDD/FDD CA or TDD/FS3 CA). A UE including this field shall not include tdd-SpecialSubframe-r14.	-
standaloneGNSS-Location	-
Indicates whether the UE is equipped with a standalone GNSS receiver that may be used to provide detailed location information in RRC measurement report and logged measurements.	
sTTI-SPT-Supported Indicates whether the UE supports the features STTI and/or SPT. If the UE supports STTI and/or SPT features, the UE shall report the field sTTI-SPT-Supported set to supported in capability signalling, irrespective of whether requestSTTI-SPT-Capability field is present or not.	-
sTTI-FD-MIMO-Coexistence	-
Indicates whether the UE supports CSI feedback for more than 8 NZP CSI-RS ports on subframe based PUSCH in any serving cell and supporting STTI in any serving cell.	
<b>sTTI-SupportedCombinations</b> Indicates the different combinations of short TTI lengths, see field description for <i>dl-STTI-Length</i> and <i>ul-STTI-Length</i> , that the UE supports in a single PUCCH group or in two PUCCH groups. A short TTI length combination is reported for DL first followed by UL. In case of two PUCCH groups the support for the primary PUCCH group is indicated first.	-
subcarrierSpacing/MBMS-khz7dot5, subcarrierSpacing/MBMS-khz1dot25 Indicates the supported subcarrier spacings for MBSFN subframes in addition to 15 kHz subcarrier spacing. subcarrierSpacing/MBMS-khz1dot25 and subcarrierSpacing/MBMS- khz7dot5 indicates that the UE supports 1.25 and 7.5 kHz respectively for MBSFN subframes as described in TS 36.211 [21], clause 6.12. This field is included only if fembmsMixedCell or fembmsDedicatedCell is included.	-

	FDD, TDD diff
subslotPDSCH-TxDiv-TM9and10	•••••
Indicates whether the UE supports TX diversity transmission using ports 7 and 8 for TM9/10 for	
subslot PDSCH.	
supportedBandCombination	-
Includes the supported CA band combinations, if any, and may include all the supported non-	
CA bands.	
supportedBandCombinationAdd-r11	-
ncludes additional supported CA band combinations in case maximum number of CA band	
combinations of supportedBandCombination is exceeded.	
SupportedBandCombinationAdd-v11d0, SupportedBandCombinationAdd-v1250,	-
SupportedBandCombinationAdd-v1270, SupportedBandCombinationAdd-v1320, SupportedBandCombinationAdd-v1380, SupportedBandCombinationAdd-v1390,	
SupportedBandCombinationAdd-v1380, SupportedBandCombinationAdd-v1390,	
SupportedBandCombinationAdd-v1430, SupportedBandCombinationAdd-v1430,	
SupportedBandCombinationAdd-v1470, SupportedBandCombinationAdd-v1450, SupportedBandCombinationAdd-v1530	
f included, the UE shall include the same number of entries, and listed in the same order, as in	
SupportedBandCombinationAdd-r11.	
SupportedBandCombinationExt, SupportedBandCombination-v1090,	
SupportedBandCombination_v10i0, SupportedBandCombination-v1030,	-
SupportedBandCombination-v1250, SupportedBandCombination-v1270,	
SupportedBandCombination-v1320, SupportedBandCombination-v1380,	
SupportedBandCombination-v1390, SupportedBandCombination-v1430,	
SupportedBandCombination-v1450, SupportedBandCombination-v1470,	
SupportedBandCombination-v14b0, SupportedBandCombination-v1530	
f included, the UE shall include the same number of entries, and listed in the same order, as in	
supportedBandCombination-r10.	
supportedBandCombinationReduced	-
ncludes the supported CA band combinations, and may include the fallback CA combinations	
specified in TS 36.101 [42], clause 4.3A. This field also indicates whether the UE supports	
eception of requestReducedFormat.	
v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-	-
SupportedBandCombinationReduced-v1320, SupportedBandCombinationReduced- v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced- v1450, SupportedBandCombinationReduced-v1470, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced- v1450	-
v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced- v1450, SupportedBandCombinationReduced-v1470, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced- v1530	-
v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced- v1450, SupportedBandCombinationReduced-v1470, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced- v1530 f included, the UE shall include the same number of entries, and listed in the same order, as in	-
v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced- v1450, SupportedBandCombinationReduced-v1470, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced- v1530 f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.	-
v1380, SupportedBandCombinationReduced-v1390, SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced- v1450, SupportedBandCombinationReduced-v1470, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced- v1530 f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13. SupportedBandGERAN	- No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].	No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT	- No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v140, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.	- No -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA	- No -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450         r1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         Dne entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in	- No -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450         r1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         Dne entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.	- No - -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450         r1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250,	- No - -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v13.         SupportedBandCombinationReduced-v13.         SupportedBandGERAN         SERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320	- No - -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         SeRAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320	- No - -
1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1450         Fincluded, the UE shall include the same number of entries, and listed in the same order, as in supportedBandGerAN         SupportedBandGerAN         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         Ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v980, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         Fincluded, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320	- No - - No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v140, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         SeRAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA.         SupportedBandListEUTRA (i.e. without suffix).	-
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListEUTRA         SupportedBandListEUTRA	-
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         tincluded, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         SERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA (i.e. without suffix).         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListERAN         SupportedBandListERAN         SupportedBandListERAN         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListERAN <td>-</td>	-
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1450         Y1530         included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGERAN         GERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA.         included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA (i.e. without suffix).         SupportedBandListEUTRA         SupportedBandListEUTRAN         SupportedBandListEUTRAN         SupportedBandListEUTRAN         SupportedBandListEUTRAN	- - - No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1480, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCerres         SupportedBandCerAN         SerAN band as defined in TS 45.005 [20].         SupportedBandListIXRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in 3andCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListECTRA         SupportedBandListECTRA         SupportedBandListERAN         SupportedBandListERAN         SupportedBandListRAN         SupportedBandListRAN         SupportedBandListtHRPD         One entry corre	- - - No
r1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1480, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCerna         SupportedBandCerna         SupportedBandCerna         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListGERAN         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListRPD         One entry corresponding to each supported CDMA2000 HRPD band class.         SupportedBandListNR-SA         ncludes the NB bands supported by the UE in NR-SA (for handover and redirection). The field as included in case the UE s	- - - No -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1480, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCerns         SupportedBandCernance         SupportedBandCernance         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListGERAN         SupportedBandListGERAN         SupportedBandListRPD         One entry corresponding to each supported CDMA2000 HRPD band class.         SupportedBandListNR-SA         ncludes the NR bands supported by the UE in NR-SA (for handover and redirection). The field is include in case the UE supports NR SA as s	- - - No -
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1480, SupportedBandCombinationReduced-v1450         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCerns         SupportedBandCernan         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v980, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1250,         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListEUTRAN         SupportedBandListEUTRAN         SupportedBandListRAN         SupportedBandListEUTRAN         SupportedBandListEUTRAN         SupportedBandListNRPD         One entry corresponding to each supported CDMA2000 HRPD band class.         SupportedBandListNRSA         SupportedBandListNRSA	- - - No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1450,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandGerAN         SupportedBandGerAN         BERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         One entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v980, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListGERAN         SupportedBandListEUTRA         SupportedBandListEUTRA         One entry corresponding to each supported CDMA2000 HRPD band class.         SupportedBandListFGERAN         SupportedBandListFWR-SA         ncludes the NR bands supported by the UE in NR-SA (for handover and redirection). The field is included in case the UE supports NR SA as specified in TS 38.331 [32] and not otherwise. The presence of this field also indicates that the UE can perform both NR SS-RSRP and SS-RSRP measurement in the included NR band(s) as specified in TS 38.215 [36	- - - No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-r13.         SupportedBandGerAN         SERAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         Dne entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in 3andCombinationParameters.         SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1250, SupportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA.v1310, SupportedBandListEUTRA-v1320         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRAN         SupportedBandListEAN         SupportedBandListRAN         SupportedBandListRAN         SupportedBandListEAN         SupportedBandListEAN         SupportedBandListEAN         SupportedBandListRAN         SupportedBandListRAN         SupportedBandListRAN         SupportedBan	- - - No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         f included, the UE shall include the same number of entries, and listed in the same order, as in supportedBandCombinationReduced-v13.         SupportedBandCombinationReduced-v13.         SupportedBandCombinationReduced-v13.         SupportedBandList1XRTT         Den entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in 3andCombinationParameters.         SupportedBandListEUTRA-v980, SupportedBandListEUTRA-v1320, field shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320, field shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA-v1310, SupportedBandListEUTRA-v1320         Fineluded, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEVTRA-V1310, SupportedCombandListEUTRA-v1320         Fine entry corresponding to each supported CDMA2000 HRPD band class.         SupportedBandListRPD         Den entry corresponding to each supported CDMA2000 HRPD band class.         SupportedBandListRPA         Den entry corresponding to each supported CDMA2000 HRPD band class.         Su	- - - No
v1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v130         SupportedBandCombinationReduced-v13.         SupportedBandERAN         SerAN band as defined in TS 45.005 [20].         SupportedBandList1XRTT         De entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in BandCombinationParameters.         SupportedBandListEUTRA-v9e0, SupportedBandListEUTRA-v1320         fincluded, the UE shall include the same number of entries, and listed in the same order, as in supportedBandListEUTRA (i.e. without suffix).         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListINR-SA         ncludes the NR bands supported by the UE in NR-SA (for handover and redirection). The field is included in case the UE supports NR SA as specified in TS 38.215 [36].         SupportedBandListEN-DC         The presence of this field also indicates that the UE can perform both NR SS-RSRP and SS-SSRP marker en-DC-r15 or ng-EN-DC is present and set to supported	- - - No
1380, SupportedBandCombinationReduced-v1390,         SupportedBandCombinationReduced-v1430, SupportedBandCombinationReduced-v1450, SupportedBandCombinationReduced-v1470,         SupportedBandCombinationReduced-v14b0, SupportedBandCombinationReduced-v1530         i included, the UE shall include the same number of entries, and listed in the same order, as in upportedBandCombinationReduced-v13.         SupportedBandCombinationReduced-v13.         SupportedBandCombinationReduced-v13.         SupportedBandList1XRTT         Die entry corresponding to each supported CDMA2000 1xRTT band class.         SupportedBandListEUTRA         ncludes the supported E-UTRA bands. This field shall include all bands which are indicated in 3andCombinationParameters.         SupportedBandListEUTRA-v980, SupportedBandListEUTRA-v1320, included, the UE shall include the same number of entries, and listed in the same order, as in upportedBandListEUTRA.         SupportedBandListEUTRA (i.e. without suffix).         SupportedBandListGERAN         SupportedBandListGERAN         SupportedBandListFAN         SupportedBandListEUTRA.         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEUTRA         SupportedBandListEU	- - - No

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
SupportedBandUTRA-FDD	-
UTRA band as defined in TS 25.101 [17].	
SupportedBandUTRA-TDD128 UTRA band as defined in TS 25.102 [18].	-
SupportedBandUTRA-TDD384	-
UTRA band as defined in TS 25.102 [18].	
SupportedBandUTRA-TDD768	-
UTRA band as defined in TS 25.102 [18]. supportedBandwidthCombinationSet	
The supportedBandwidthCombinationSet indicated for a band combination is applicable to all	
bandwidth classes indicated by the UE in this band combination.	
Field encoded as a bit map, where bit N is set to "1" if UE support Bandwidth Combination Set	
N for this band combination, see 36.101 [42]. The leading / leftmost bit (bit 0) corresponds to the Bandwidth Combination Set 0, the next bit corresponds to the Bandwidth Combination Set	
1 and so on. The UE shall neither include the field for a non-CA band combination, nor for a	
CA band combination for which the UE only supports Bandwidth Combination Set 0.	
supportedCellGrouping	-
This field indicates for which mapping of serving cells to cell groups (i.e. MCG or SCG) the UE supports asynchronous DC. This field is only present for a band combination with more than	
two but less than six band entries where the UE supports asynchronous DC. If this field is not	
present but asynchronous operation is supported, the UE supports all possible mappings of	
serving cells to cell groups for the band combination. The bitmap size is selected based on the	
number of entries in the combinations, i.e., in case of three entries, the bitmap corresponding to <i>threeEntries</i> is selected and so on.	
A bit in the bit string set to 1 indicates that the UE supports asynchronous DC for the cell	
grouping option represented by the concerned bit position. Each bit position represents a	
different cell grouping option, as illustrated by a table, see NOTE 5. A cell grouping option is	
represented by a number of bits, each representing a particular band entry in the band	
combination with the left-most bit referring to the band listed first in the band combination, etc. Value 0 indicates that the carriers of the corresponding band entry are mapped to a first cell	
group, while value 1 indicates that the carriers of the corresponding band entry are mapped to a matcell	
a second cell group.	
It is noted that the mapping table does not include entries with all bits set to the same value (0	
or 1) as this does not represent a DC scenario (i.e. indicating that the UE supports that all carriers of the corresponding band entry are in one cell group).	
supportedCSI-Proc, sTTI-SupportedCSI-Proc	-
Indicates the maximum number of CSI processes supported on a component carrier within a	
band. Value n1 corresponds to 1 CSI process, value n3 corresponds to 3 CSI processes, and	
value n4 corresponds to 4 CSI processes. If this field is included, the UE shall include the same number of entries listed in the same order as in <i>BandParameters/STTI-SPT</i> -	
BandParameters. If the UE supports at least 1 CSI process on any component carrier, then the	
UE shall include this field in all bands in all band combinations.	
supportedCSI-Proc (in FeatureSetDL-PerCC)	-
In MR-DC, indicates the number of CSI processes for the component carrier in the corresponding bandwidth class. If the UE supports at least 1 CSI process, then the UE shall	
include this field.	
supportedMIMO-CapabilityDL-MRDC (in FeatureSetDL-PerCC)	-
In MR-DC, indicates the maximum number of supported layers in TM9/10 for the component	
carrier in the corresponding bandwidth class.	
<i>supportedNAICS-2CRS-AP</i> If included, the UE supports NAICS for the band combination. The UE shall include a bitmap of	-
the same length, and in the same order, as in <i>naics-Capability-List</i> , to indicate 2 CRS AP	
NAICS capability of the band combination. The first/ leftmost bit points to the first entry of	
naics-Capability-List, the second bit points to the second entry of naics-Capability-List, and so	
on. For band combinations with a single component carrier, UE is only allowed to indicate	
{ <i>numberOfNAICS-CapableCC, numberOfAggregatedPRB</i> } = {1, 100} if NAICS is supported.	
supportedOperatorDic	-
Indicates whether the UE supports operator defined dictionary. If UE supports operator defined	
dictionary, the UE shall report <i>versionOfDictionary</i> and <i>associatedPLMN-ID</i> of the stored	
operator defined dictionary. This parameter is not required to be present if the UE is in VPLMN. In this release of the specification, UE can only support one operator defined dictionary. The	
associated PLMN-ID is only associated to the operator defined dictionary which has no	
relationship with UE's HPLMN ID.	

Indicates whether the UE supports ROHC context upon handover.         Indicates upports ROHC context upon handover.           supported/ROHC-Profiles         Indicates the ROHC profiles that UE supports in both uplink and not in downlink. see TS 36.323 [8]         Indicates the ROHC profiles that UE supports in uplink and not in downlink, see TS 36.323 [8].           Supported/ROHC-Profiles         Indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS 36.323 [8].         Indicates whether the UE supports but data compression, see TS 36.323 [8].           Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate ( <i>AC Special/Subframe-r11</i> if it supports the TDD special subframe ssp7 and ssp8. A UE shall indicate ( <i>AC Special/Subframe-r11</i> if it supports the TDD special subframe ssp7 and ssp8. A UE shall indicate ( <i>AC Special/Subframe-r11</i> if it supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> and at least one FDD band with bandParametersUL and at least one FDD band	UE-EUTRA-Capability field descriptions	FDD/ TDD diff
inclustes the current ROHC context upon handover.         supportedROHC-Profiles         indicates the ROHC profiles that UE supports in both uplink and downlink.         supportedStandardDic         indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS         38.323 [8].         supportedStandardDic         Indicates whether the UE supports DL data compression, see TS 36.323 [8].         tdd-SpecialSubframer         Indicates whether the UE supports DD special subframe defined in TS 36.211 [21]. A UE shall indicate tdd-SpecialSubframer-14 if it supports TDD special subframes spr3 and ssp8. A UE shall indicate tdd-SpecialSubframer-14 if it supports TDD/FDD CA in any supported band combination including at least one FDD band with bandParametersUL and at least one TDD band with bandParametersUL and at least one TDD band with bandParametersUL. The supports TDD/FDD CA in any supported band combination including at least one FDD band with bandParametersUL. The supports TDD/FDD CA in any supports to TDD/FDD CA in any supported band combination including at least one FDD band with bandParametersUL. The supports TDD/FDD CA in any supports the TDD band in the same CG, with the value indicating the supports for TDD/FDD CA in any supports for TDD/FDD CA in any supports for TDD/FDD CA in any supports the TDD band in the same CG, with the value indicating the supports of this field indicates whether the UE supports TDD/FDD CA in any supports the TDD band with bandParametersUL. The field is included.         tdd-SpecialSubframe-10.       The presence of this field indicates whether the UE supports TDD/FDD CA in any supports for TDD/FDD CA in any supported band combination including sthest stone	supportRohcContextContinue	-
supportedROHC-Profiles		
Indicates the ROHC profiles that UE supports in both uplink and downlink.       •         supported/Standardbic       •         Indicates the ROHC profiles that UE supports in uplink and not in downlink, see TS 36.323 [8].       •         supported/Standardbic       •         Indicates whether the UE supports bL data compression, see TS 36.323 [8].       •         Supported/Standardbic       •         Indicates whether the UE supports UL data compression, see TS 36.323 [8].       •         Supported/Standardbic       •         Indicates whether the UE supports DD special subframe defined in TS 36.211 [21]. A UE shall indicate <i>idd-Special/Subframe-r11</i> if it supports the TDD special subframe ssp10.       Yes         Shall indicate <i>idd-Special/Subframe-r11</i> if it supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParameters/L</i> and at least one TDD band with <i>bandParameters/L</i> and at least one TDD band with <i>bandParameters/L</i> . The first bit is set or 1*1 if UE supports TDD/FDD CA with at least one FDD band with <i>bandParameters/L</i> . The first bit is set or 1*1 if UE supports TDD/FDD CA with at least one FDD band with <i>bandParameters/L</i> . The first bit is set or 1*1 if UE supports TDD/FDD CA with at least one FDD band in the same CG, with the value indicating the support for TDD/FDD PCeII. (This field is included only if the UE supports TDD/FDD CA with at least one FDD band in the same CG, with the value indicating the support for TDD/FDD CA with at least one FDD band in the same CG, with the value indicates whether the UE supports TDD/FDD CA with at least one FDD bade and in thesame CG, with the value indicates whether the UE suppo		
supported/UpinkOn/ROHC-Profiles		-
Indicates the ROHC profiles that UE supports in uplink and not in downlink, see TS 36.323 [8] supportedStandardDic Indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS 36.323 [8]. SupportedUDC Indicates whether the UE supports DD special subframe defined in TS 36.211 [21]. A UE shall indicate ( <i>dd-SpecialSubframe-11</i> if it supports the TDD special subframe ssp7 and ssp8. A UE shall indicate <i>tdd-SpecialSubframe-11</i> if it supports the TDD special subframes sp10, except when ssp10-TDD-Only-r14 is included. <i>tdd-FDD-CA-PCellDuplex</i> The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . The first bit is set to "1" if UE supports the TDD PCell. The second bit is set to "1" if UE supports both only if the UE supports band combination including at least one FDD band with <i>bandParametersUL</i> and at least one of the bits as "1". If this field is included, the UE shall set at least one of the bits as "1". If this field is included, the UE shall set at least one of the bits as "1". If this field is included, the UE supports band and at least one FDD band with <i>bandParametersUL</i> . The field is sincluded, the UE shall staft at least one FDD band with bandParametersUL. The same CG, with the value indicating the support for TDD/FDD PCell (PSCell). <i>tdd-TTD-DDPONIY-11</i> shall be present. <i>timeReferenceProvision</i> Indicates whether the UE supports provision of time reference in <i>DLInformationTransfer</i> <i>message</i> . <i>time71312</i> Indicates whether the UE supports the PDSCH transmission mode 5 in FDD. Indicates whether the UE supports the PDSCH transmission mode 5 in TDD. <i>tm6-CE-ModeA</i> Indicates whether the UE supports the OPSCH transmission mode 5 in TDD. <i>tm6-CE-ModeA</i> Indicates whether the UE supports the operation in CE mode A, see TS 36.213 [23], clause 7.2.3. This field can be included only if <i>ce-ModeA</i> is inc		
supportedStandardDic Indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS 36.323 [8].         -           supportedUDC Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate tod-SpecialSubframe-r11 if it supports the TDD special subframes ssp7 and ssp1. A UE shall indicate tod-SpecialSubframe-r11 if it supports the TDD special subframes ssp7 and the SpecialSubframe.         Yes           holicates whether the UE supports TDD-Only-r14 is included.         No           tdd-FDD-CA-PCeIIDuplex         No           The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with bandParametersUL and at least one TDD band with bandParametersUL. The first bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports FDD PCeII. This field is included only if the UE supports band combination including at least one FDD band with bandParametersUL and at least one FDD band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PCeI (PSCeII).         Yes           tdd-SpecialSubframe-r14 or ssp10-TDD-Only-r14 shall be present.         *         *           infidicates the capability of the UE to support TDD/FDD CA with at least one FDD band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PCII (PSCeII).         *           tdd-SpecialSubframe-r14 or ssp10-TDD-Only-r14 shall be present.         *         *           infidicates whether the UE supports T312.         *         *           indicates whether		-
Indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS         supportedUDC       -         Indicates whether the UE supports UL data compression, see TS 36.323 [8].       -         Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE       Yes         Shall indicate <i>tidd-SpecialSubframe-r114</i> if it supports the TDD special subframe ssp7 and       ssp8. A UE shall indicate <i>tidd-SpecialSubframe-r144</i> if it supports the TDD special subframe ssp7 and         ssp0.       A UE shall indicate <i>tidd-SpecialSubframe-r144</i> if it supports TDD/FDD CA in any supported band       No         trd/FDD-CA-PCeIIDuplex       No       No         The presence of this field includates that the UE supports TDD/FDD CA in any supported band       No         second bit is set to "1" if UE supports TDD PCeII. The       Second bit is set to "1" if UE supports TDD/FDD CA with at least one TDD         band and at least one TDD band with <i>bandParametersUL</i> and at least one TDD       Data with <i>bandParametersUL</i> . The life is included, the UE supports TDD/FDD CA with at least one FDD         band and at least one TDD band in the same CG, with the value indicating the support for TDD/FD PCeII. The       Second bit is field indicates whether the UE to support TDD/FDD CA with at least one FDD         band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PCeII. The second this field indicates whether the UE supports TDD-Only-r14 shall be present.       Yes         indicates whether the		-
Indicates whether the UE supports UL data compression, see TS 36.323 [8].         Yes           Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate total-SpecialSubframer-11 if it supports the TDD special subframes ssp7 and ssp1. A UE shall indicate total-SpecialSubframer-11 if it supports the TDD special subframe ssp10, except when ssp10-TDD-Only-r14 is included.         No           Inderstein Add-SpecialSubframer-11 if it supports the TDD special subframe ssp10, except when ssp10-TDD-Only-r14 is included.         No           The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with bandParametersUL and at least one TDD band with bandParametersUL. The first bit is set to "1" if UE supports FDD PCeII. This field is included only if the UE supports band on the bandParametersUL. The first bit is set to "1" if UE supports TDD/FDD CA with at least one FDD band with bandParametersUL and at least one fDD band at least one TDD band in the same CG, with the value indicating the support for TDD/FDD CeII (PSCeII).           TDD/FDD FCII (PSCeII)         Yes           tdd-SpecialSubframer-14 if sheld indicates whether the UE supporting TDD special subframe for the discase whether the UE supports TDD/FDD Call with the Presence of this field indicates the same Sci C3.213 [23], clause 8.0. If this field is present, the tdd-SpecialSubframer-14 if the supports TDD/FDD-Chiy-r14 shall be present.         Yes           Indicates whether the UE supports T312.         Tm6-FCAMOdeA         -           Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.         -         -	Indicates whether the UE supports standard dictionary for SIP and SDP as specified in TS 36.323 [8].	
tid-SpecialSubframe         Yes           Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate tidd-SpecialSubframe-r11 if it supports the TDD special subframe ssp7 and ssp9. A UE shall indicate tidd-SpecialSubframe-r14 if it supports the TDD special subframe ssp7 and ssp9. A UE shall indicate tidd-SpecialSubframe-r14 if it supports the TDD Special subframe ssp7 and ssp9. A UE shall indicate that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with bandParametersUL and at least one TDD band with bandParametersUL and at least one TDD band with bandParametersUL and at least one TDD band with bandParametersUL its shall set to "1" if UE supports TDD/FDD CA in any supports band combination including at least one FDD Dand with bandParametersUL and at least one of the bits as "1". If this field is included with DC, then it is applicable within a CG, and the presence of this field indicates whether the UE supports TDD/FDD CA with at least one FDD band with bandParametersUL if the Shall set at least one FDD band with at least one TDD configuration 2 and 3 when PUSCH transmission in UPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the tid-SpecialSubframe-r14 or sp10-DD/Only-r14 shall be present.           tideReferenceProvision         -           Indicates whether the UE supports T312.         -           timeReferenceProvision         -           Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.         -           Indicates whether the UE supports the Operation in CE mode A, see TS 36.213 [23], clause 7.3. This field can be included only if ce-ModeA is included.         Yes               Indicates whethere the UE supports	supportedUDC	-
Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate <i>tdd-SpecialSubframe-r11</i> if it supports the TDD special subframe ssp7 and ssp0. A UE shall indicate <i>tdd-SpecialSubframe-r11</i> if it supports the TDD special subframe ssp10, except when ssp10-TDD-Only-r14 is included.       No         Midd-FDD-CA-PCeIIDuplex       No         The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . The first bit is set to "1" if UE supports the TDD PCell. The second bit is set to "1" if UE supports FDD PCell. This field is included, the UE shall set at least one FDD band with <i>bandParametersUL</i> . If this field is included, the UE shall set at least one FDD band with <i>bandParametersUL</i> .       No         TDD band with <i>bandParametersUL</i> . If this field is included, the UE shall set at least one FDD band with <i>bandParametersUL</i> .       Yes         TDD/FDD FCeI (PSCeII).       The presence of this field indicates whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when PUSCH transmission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the <i>tdd-SpecialSubframe-14 or ssp10-FDD-Conly-r14</i> shall be present.       Yes         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -       -         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -       -		Vaa
tide-FDD-CA-PCeIDuplex       No         The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . The first bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCeII. The second bit is set to "1" if UE supports the TDD PCDI CA and at least one of the bits as "1". If this field is included, the UE to support TDD/FDD CA with at least one fDD band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PCeII (PSCeII).       Yes         tdd-TTI-Bundling       Yes         The presence of this field indicates whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when PUSCH transmission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the tdd-Special/Subframe-r14 or ssp10-TDD-ON/-r14 shall be present.       ImmeReferenceProvision       -         Indicates whether the UE supports T312.       Mo       -       -         time7312       No       -       -       -         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -       -       -         indicates whether the UE supports the operation in CE mode A, see TS 36.213 [23], clause <td>Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate <i>tdd-SpecialSubframe-r11</i> if it supports the TDD special subframes ssp7 and ssp9. A UE shall indicate <i>tdd-SpecialSubframe-r14</i> if it supports the TDD special subframe</td> <td>res</td>	Indicates whether the UE supports TDD special subframe defined in TS 36.211 [21]. A UE shall indicate <i>tdd-SpecialSubframe-r11</i> if it supports the TDD special subframes ssp7 and ssp9. A UE shall indicate <i>tdd-SpecialSubframe-r14</i> if it supports the TDD special subframe	res
The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . The first bit is set to "1" if UE supports the TDD PCell. The second bit is set to "1" if UE supports FDD PCell. This field is included only if the UE supports band combination including at least one FDD band with <i>bandParametersUL</i> . and at least one of the bits as "1". If this field is included with DC, then it is applicable within a CG, and the presence of this field indicates the capability of the UE to support TDD/FDD CA with at least one FDD band and at least one TDD band in the same CG, with the value indicating the support for TDD/FDD PC all (PSCell). TDD/FDD PCell (PSCell). TDD/FDD PCell (PSCell). TDD/FDD PCell (PSCell). The field is included, the UE supporting TDD special subframe configuration 10 also supports TT bundling for TDD configuration 2 and 3 when PUSCH transmission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the tdd-SpecialSubframer-r14 or ssp10-TDD-Only-r14 shall be present. the tdd-SpecialSubframer-r14 or ssp10-TDD-Only-r14 shall be present. the tdf-SpecialSubframer-r14 or ssp10-TDD-Only-r14 shall be present. the tdf-SpecialSubframe r14 or ssp10-TDD CA with the value indicates whether the UE supports the PDSCH transmission mode 5 in TDD. the fold cas whether the UE supports the PDSCH transmission mode 5 in TDD. t		No
tdd-TTI-Bundling       Yes         The presence of this field indicates whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when PUSCH transmission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the tdd-SpecialSubframe-r14 or ssp10-TDD-Only-r14 shall be present.       -         timeReferenceProvision       -         Indicates whether the UE supports provision of time reference in DLInformationTransfer       -         message.       -         tims-FDD       -         Indicates whether the UE supports T312.       No         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the Operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       -         tm8-slotPDSCH       -       -         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       -         tm8-slotPDSCH       -       -         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.	The presence of this field indicates that the UE supports TDD/FDD CA in any supported band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . The first bit is set to "1" if UE supports the TDD PCell. The second bit is set to "1" if UE supports FDD PCell. This field is included only if the UE supports band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . If this field is included only if the UE supports band combination including at least one FDD band with <i>bandParametersUL</i> and at least one TDD band with <i>bandParametersUL</i> . If this field is included, the UE shall set at least one of the bits as "1". If this field is included with DC, then it is applicable within a CG, and the presence of this field indicates the capability of the UE to support TDD/FDD CA with at least one FDD band and at least one TDD band in the same CG, with the value indicating the support for	
The presence of this field indicates whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when PUSCH transimission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the tdd-SpecialSubframe-r14 or ssp10-TDD-Only-r14 shall be present.         timeReferenceProvision       -         Indicates whether the UE supports provision of time reference in DLInformationTransfer message.       -         timerT312       No         Indicates whether the UE supports T312.       -         tm5-TDD       -         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       -         T.2.3. This field can be included only if <i>ce-ModeA</i> is included.       -         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       -         T.2.3. This field can be included only if		Voc
Indicates whether the UE supports provision of time reference in DLInformationTransfer         message.         timerT312       No         Indicates whether the UE supports T312.       No         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the OPSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the OPSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports the OPSCH transmission mode 5 in TDD.       -         Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if ce-ModeB is included.       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if ce-ModeB is included.       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if ce-Mode	The presence of this field indicates whether the UE supporting TDD special subframe configuration 10 also supports TTI bundling for TDD configuration 2 and 3 when PUSCH transimission in UpPTS is configured, see TS 36.213 [23], clause 8.0. If this field is present, the <i>tdd-SpecialSubframe-r14</i> or <i>ssp10-TDD-Only-r14</i> shall be present.	163
message.       imerT312       No         Indicates whether the UE supports T312.       ims         tm5-FDD       -         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -         tm5-FDD       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         tm6-CE-ModeA       -         Indicates whether the UE supports the OPSCH transmission mode 5 in TDD.       -         tm6-CE-ModeA       Yes         Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       -         tm9-CE-ModeA       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       -         tm9-CE-ModeB       Yes       -         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if <i>ce-ModeB</i> is included.       -         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if <i>ce-ModeB</i> is included.       -         Indicates whether the UE supports tm9 ope	timeReferenceProvision	-
timerT312NoIndicates whether the UE supports T312Indicates whether the UE supports the PDSCH transmission mode 5 in FDDIndicates whether the UE supports the PDSCH transmission mode 5 in TDDIndicates whether the UE supports the PDSCH transmission mode 5 in TDDIndicates whether the UE supports the PDSCH transmission mode 5 in TDDIndicates whether the UE supports the Operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDDIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if <i>ce-ModeB</i> is included <i>tm9-LEAA</i> Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if <i>co-ModeB</i> is included <i>tm9-slotSubslot</i> Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-PDSCH for non-MBSFNIndicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-PDSCH for non-MBSFNIndicates whether the UE supports configuration and decoding of	Indicates whether the UE supports provision of time reference in DLInformationTransfer	
Indicates whether the UE supports T312.       - <i>tm5-FDD</i> -         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       - <i>tm5-TDD</i> -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       - <i>tm6-CE-ModeA</i> Yes         Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       - <i>tm8-slotPDSCH</i> -         Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.       - <i>tm9-CE-ModeA</i> Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if <i>ce-ModeB</i> is included.       - <i>tm9-LAA</i> -       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if <i>co-ModeB</i> is included.       - <i>tm9-LAA</i> -       -         Indicates whether the	message.	
tm5-FDD       -         Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       -         tm5-TDD       -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       -         tm6-CE-ModeA       Yes         Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if ce-ModeA is included.       -         tm8-slotPDSCH       -         Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.       -         tm9-CE-ModeA       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if ce-ModeA is included.       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if ce-ModeB is included.       -         tm9-CE-ModeB       -       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE suppo		No
Indicates whether the UE supports the PDSCH transmission mode 5 in FDD.       - <i>tm5-TDD</i> -         Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.       Yes         Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       - <i>tm8-slotPDSCH</i> -         Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.       -         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot		
tm5-TDD-Indicates whether the UE supports the PDSCH transmission mode 5 in TDDtm6-CE-ModeAYesIndicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if ce-ModeA is includedtm8-slotPDSCH-Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDDIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation on LAA cell(s). This field can be included-Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included-Indicates whether the UE supports tm9 operation and decoding of TM9 for slot and/or subslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-		-
Indicates whether the UE supports the PDSCH transmission mode 5 in TDD.YesIndicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if ce-ModeA is includedIndicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDDIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clauseYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause-7.2.3. This field can be included only if ce-ModeB is includedtm9-CE-ModeBIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause-7.2.3. This field can be included only if ce-ModeB is includedtm9-LAAIndicates whether the UE supports tm9 operation on LAA cell(s). This field can be included-only if downlinkLAA is includedtm9-SlotSubslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-PDSCH for non-MBSFNIndicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot- <td>···</td> <td></td>	···	
tm6-CE-ModeAYesIndicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if <i>ce-ModeA</i> is includedtm8-slotPDSCH-Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDDtm9-CE-ModeAYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if <i>ce-ModeA</i> is included.Yestm9-CE-ModeBYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if <i>ce-ModeA</i> is included.Yestm9-CE-ModeBYesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause-7.2.3. This field can be included only if <i>ce-ModeB</i> is includedtm9-LAAIndicates whether the UE supports tm9 operation on LAA cell(s). This field can be included-only if <i>downlinkLAA</i> is includedtm9-slotSubslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-PDSCH for non-MBSFNIndicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-PDSCH for non-MBSFNIndicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-		-
Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       - <i>tm8-slotPDSCH</i> -         Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -		Yee
Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.       Yes         Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if ce-ModeA is included.       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if ce-ModeB is included.       - <i>tm9-LAA</i> -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if downlinkLAA is included.       - <i>tm9-slotSubslot</i> -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         PDSCH for non-MBSFN.       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -	Indicates whether the UE supports tm6 operation in CE mode A, see TS 36.213 [23], clause 7.2.3. This field can be included only if <i>ce-ModeA</i> is included.	103
tm9-CE-ModeAYesIndicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if ce-ModeA is included.YesIndicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clauseYes7.2.3. This field can be included only if ce-ModeB is included.YesIndicates whether the UE supports tm9 operation on CE mode B, see TS 36.213 [23], clauseYes1.2.3. This field can be included only if ce-ModeB is includedtm9-LAA-Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included-only if downlinkLAA is includedtm9-slotSubslot-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-PDSCH for non-MBSFNtm9-slotSubslotMBSFN-Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot-	tm8-slotPDSCH	-
Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if <i>ce-ModeA</i> is included.       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       Yes         7.2.3. This field can be included only if <i>ce-ModeB</i> is included.       Yes         Indicates whether the UE supports tm9 operation on CE mode B, see TS 36.213 [23], clause       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included only if <i>downlinkLAA</i> is included.       -         Indicates whether the UE supports tm9 operation and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -	Indicates whether the UE supports configuration and decoding of TM8 for slot PDSCH in TDD.	
tm9-CE-ModeB       Yes         Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause       -         7.2.3. This field can be included only if ce-ModeB is included.       -         tm9-LAA       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         only if downlinkLAA is included.       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         PDSCH for non-MBSFN.       -         tm9-slotSubslotMBSFN       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -	<i>tm9-CE-ModeA</i> Indicates whether the UE supports tm9 operation in CE mode A, see TS 36.213 [23], clause 7.2.3. This field can be included only if <i>ce-ModeA</i> is included.	Yes
tm9-LAA       -         Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included       -         only if downlinkLAA is included.       -         tm9-slotSubslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         PDSCH for non-MBSFN.       -         tm9-slotSubslotMBSFN       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -	<i>tm9-CE-ModeB</i> Indicates whether the UE supports tm9 operation in CE mode B, see TS 36.213 [23], clause	Yes
tm9-slotSubslot       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -         PDSCH for non-MBSFN.       -         tm9-slotSubslotMBSFN       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -	<i>tm9-LAA</i> Indicates whether the UE supports tm9 operation on LAA cell(s). This field can be included	-
Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       PDSCH for non-MBSFN.         tm9-slotSubslotMBSFN       -         Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot       -	only if downlinkLAA is included.	
Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot	Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot PDSCH for non-MBSFN.	-
	<i>tm9-slotSubslotMBSFN</i> Indicates whether the UE supports configuration and decoding of TM9 for slot and/or subslot PDSCH for MBSFN.	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
tm9-With-8Tx-FDD	Yes
Indicates whether the UE supports PDSCH transmission mode 9 with 8 CSI reference signal	
ports for FDD when not operating in CE mode. <i>tm10-LAA</i>	
Indicates whether the UE supports tm10 operation on LAA cell(s). This field can be included	-
only if <i>downlinkLAA</i> is included.	
tm10-slotSubslot	-
Indicates whether the UE supports configuration and decoding of TM10 for slot and/or subslot	
PDSCH for non-MBSFN.	
tm10-slotSubslotMBSFN	-
Indicates whether the UE supports configuration and decoding of TM10 for slot and/or subslot	
PDSCH for MBSFN.	
totalWeightedLayers	-
Indicates total number of weighted layers the UE can process for FD-MIMO. See NOTE 8.	
twoAntennaPortsForPUCCH	No
twoStepSchedulingTimingInfo	-
Presence of this field indicates that the UE supports uplink scheduling using PUSCH trigger A	
and PUSCH trigger B (as defined in TS 36.213 [23]).	
This field also indicates the timing between the PUSCH trigger B and the earliest time the UE supports performing the associated UL transmission. For reception of PUSCH trigger B in	
subframe N, value <i>nPlus1</i> indicates that the UE supports performing the UL transmission in	
subframe N, value <i>nPlus2</i> indicates that the UE supports performing the UL transmission in	
subframe N+2, and so on.	
This field can be included only if <i>uplinkLAA</i> is included.	
txAntennaSwitchDL, txAntennaSwitchUL	-
The presence of <i>txAntennaSwitchUL</i> indicates the UE supports transmit antenna selection for	
this UL band in the band combination as described in TS 36.213 [23], clauses 8.2 and 8.7.	
The field txAntennaSwitchDL indicates the entry number of the first-listed band with UL in the	
band combination that affects this DL. The field txAntennaSwitchUL indicates the entry number	
of the first-listed band with UL in the band combination that switches together with this UL.	
Value 1 means first entry, value 2 means second entry and so on. All DL and UL that switch	
together indicate the same entry number.	
For the case of carrier switching, the antenna switching capability for the target carrier	
configuration is indicated as follows:	
For UE configured with a set of component carriers belonging to a band combination $C_{\text{baseline}} = \{b_1(1),,b_x(1),,b_y(0),\}$ , where "1/0" denotes whether the corresponding band has an uplink,	
if a component carrier in $b_x$ is to be switched to a component carrier in $b_y$ (according to srs-	
SwitchFromServCellIndex), the antenna switching capability is derived based on band	
combination $C_{target} = \{b_1(1), \dots, b_x(0), \dots, b_y(1), \dots\}$ .	
txDiv-PUCCH1b-ChSelect	Yes
Indicates whether the UE supports transmit diversity for PUCCH format 1b with channel	100
selection.	
txDiv-SPUCCH	-
Indicates whether the UE supports Tx diversity on SPUCCH format 1/1a/1b/3.	
uci-PUSCH-Ext	No
Indicates whether the UE supports an extension of UCI delivering more than 22 HARQ-ACK	
bits on PUSCH as specified in TS 36.212 [22], clause 5.2.2.6 and TS 36.213 [23], clause 8.6.3.	
ue-AutonomousWithFullSensing	-
Indicates whether the UE supports transmitting PSCCH/PSSCH using UE autonomous	
resource selection mode with full sensing (i.e., continuous channel monitoring) for V2X sidelink	
communication and the UE supports maximum transmit power associated with Power class 3	
V2X UE, see TS 36.101 [42].	
ue-AutonomousWithPartialSensing	-
Indicates whether the UE supports transmitting PSCCH/PSSCH using UE autonomous	
resource selection mode with partial sensing (i.e., channel monitoring in a limited set of	
subframes) for V2X sidelink communication and the UE supports maximum transmit power associated with Power class 3 V2X UE, see TS 36.101 [42].	
ue-Category	
UE category as defined in TS 36.306 [5]. Set to values 1 to 12 in this version of the	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<b>ue-CategoryDL</b> UE DL category as defined in TS 36.306 [5]. Value <i>n17</i> corresponds to UE category 17, value <i>m1</i> corresponds to UE category M1, value <i>oneBis</i> corresponds to UE category 1bis, value m2 corresponds to UE category M2. For ASN.1 compatibility, a UE indicating DL category 0, m1 or m2 shall also indicate any of the categories (15) in <i>ue-Category</i> (without suffix), which is ignored by the eNB, a UE indicating UE category oneBis shall also indicate UE category 1 in <i>ue-Category</i> (without suffix), and a UE indicating UE category m2 shall also indicate UE category m1. The field <i>ue-CategoryDL</i> is set to values 0, m1, oneBis, m2, 4, 6, 7, 9 to 16, n17, 18, 19, 20, 21, 22, 23, 24, 25, 26 in this version of the specification.	-
<i>ue-CategorySL-C-TX</i> UE SL category for V2X transmission as defined in TS 36.306 [5]. Set to values 1 to 5 in this version of the specification.	-
<i>ue-CategorySL-C-RX</i> UE SL category for V2X reception as defined in TS 36.306 [5]. Set to values 1 to 4 in this version of the specification.	-
<b>ue-CategoryUL</b> UE UL category as defined in TS 36.306 [5]. Value <i>n14</i> corresponds to UE category 14, value <i>m1</i> corresponds to UE category M1, value <i>oneBis</i> corresponds to UE category 1bis, value <i>n21</i> corresponds to UE category 21. The field <i>ue-CategoryUL</i> is set to values m1, 0, oneBis, 3, 5, 7, 8, 13, n14, 15 to 20, n21 or 22 to 26 in this version of the specification.	-
<i>ue-CA-PowerClass-N</i> Indicates whether the UE supports UE power class N in the E-UTRA band combination, see TS 36.101 [42] and TS 36.307 [78]. If <i>ue-CA-PowerClass-N</i> is not included, UE supports the default UE power class in the E-UTRA band combination, see TS 36.101 [42].	-
<i>ue-CE-NeedULGaps</i> Indicates whether the UE needs uplink gaps during continuous uplink transmission in FDD as specified in TS 36.211 [21] and TS 36.306 [5].	-
<i>ue-PowerClass-N, ue-PowerClass-5</i> Indicates whether the UE supports UE power class 1, 2, 4 or 5 in the E-UTRA band, see TS 36.101 [42] and TS 36.307 [79]. UE includes either <i>ue-PowerClass-N</i> or <i>ue-PowerClass-5</i> . If neither <i>ue-PowerClass-N</i> nor <i>ue-PowerClass-5</i> is included, UE supports the default UE power	-
class in the E-UTRA band, see TS 36.101 [42]. ue-Rx-TxTimeDiffMeasurements	No
Indicates whether the UE supports Rx - Tx time difference measurements. ue-SpecificRefSigsSupported	No
ue-SSTD-Meas Indicates whether the UE supports SSTD measurements between the PCell and the PSCell as specified in TS 36.214 [48] and TS 36.133 [16].	-
<i>ue-TxAntennaSelectionSupported</i> Except for the supported band combinations for which <i>bandParameterList-v1380</i> is included, TRUE indicates that the UE is capable of supporting UE transmit antenna selection such that all the supported bands in the band combination are affected by transmit antenna switching, as described in TS 36.213 [23], clause 8.7. E-UTRAN ignores this field for band combinations for which <i>bandParameterList-v1380</i> is included.	Yes
<i>ue-TxAntennaSelection-SRS-1T4R</i> Indicates whether the UE supports selecting one antenna among four antennas to transmit SRS for the corresponding band of the band combination as described in TS 36.213 [23].	-
<i>ue-TxAntennaSelection-SRS-2T4R-2Pairs</i> Indicates whether the UE supports selecting one antenna pair between two antenna pairs to transmit SRS simultaneously for the corresponding band of the band combination as described in TS 36.213 [23].	-
<i>ue-TxAntennaSelection-SRS-2T4R-3Pairs</i> Indicates whether the UE supports selecting one antenna pair among three antenna pairs to transmit SRS simultaneously for the corresponding band of the band combination as described in TS 36.213 [23].	-
<b>ul-64QAM</b> Indicates whether the UE supports 64QAM in UL on the band. This field is only present when the field ue- <i>CategoryUL</i> indicates UL UE category that supports UL 64QAM, see TS 36.306 [5], Table 4.1A-2. If the field is present for one band, the field shall be present for all bands including downlink only bands.	-
<i>ul-256QAM</i> Indicates whether the UE supports 256QAM in UL on the band in the band combination. This field is only present when the field ue- <i>CategoryUL</i> indicates UL UE category that supports 256QAM in UL, see TS 36.306 [5], Table 4.1A-2. The UE includes this field only if the field <i>ul-256QAM-perCC-InfoList</i> is not included.	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
ul-256QAM-perCC-InfoList	-
Indicates, per serving carrier of which the corresponding bandwidth class includes multiple serving carriers (i.e. bandwidth class B, C, D and so on), whether the UE supports 256QAM in	
the band combination. The number of entries is equal to the number of component carriers in the corresponding bandwidth class. The UE shall support the setting indicated in each entry of the list regardless of the order of entries in the list. This field is only present when the field <i>ue</i> -	
CategoryUL indicates UL UE category that supports 256QAM in UL, see TS 36.306 [5], Table 4.1A-2. The UE includes this field only if the field <i>ul-256QAM</i> is not included. <i>ul-256QAM-Slot</i>	
Indicates whether the UE supports 256QAM in UL for slot TTI operation on the band. <i>uI-256QAM-Subslot</i>	_
Indicates whether the UE supports 256QAM in UL for subslot TTI operation on the band.	
ul-AsyncHarqSharingDiff-TTI-Lengths	-
Indicates whether the UE supports UL asynchronous HARQ sharing between different TTI lengths for an UL serving cell.	
ul-CoMP Indicates whether the UE supports UL Coordinated Multi-Point operation.	No
<i>ul-dmrs-Enhancements</i> Indicates whether the UE supports UL DMRS enhancements as defined in TS 36.211 [21], clause 6.10.3A.	FFS
<i>ul-PDCP-Delay</i> Indicates whether the UE supports UL PDCP Packet Delay per QCI measurement as specified in TS 36.314 [71].	-
ul-powerControlEnhancements Indicates whether UE supports UplinkPowerControlDedicated.	
uplinkLAA Presence of the field indicates that the UE supports uplink LAA operation.	-
<i>uss-BlindDecodingAdjustment</i> Indicates whether the UE supports blind decoding adjustment on UE specific search space as defined in TS 36.213 [22]. This field can be included only if uplinkLAA is included.	-
uss-BlindDecodingReduction	-
Indicates whether the UE supports blind decoding reduction on UE specific search space by not monitoring DCI format 0A/0B/4A/4B as defined in TS 36.213 [22]. This field can be included only if uplinkLAA is included.	
unicastFrequencyHopping	-
Indicates whether the UE supports frequency hopping for unicast MPDCCH/PDSCH	
(configured by <i>mpdcch-pdsch-HoppingConfig</i> ) and unicast PUSCH (configured by <i>pusch-HoppingConfig</i> ).	
<i>unicast-fembmsMixedSCell</i> Indicates whether the UE supports unicast reception from FeMBMS/Unicast mixed cell. This field is included only if UE supports carrier aggregation.	No
utra-GERAN-CGI-Reporting-ENDC Indicates whether the UE supports Inter-RAT report CGI procedure towards GERAN/UTRA cell	Yes
when it is configured with (NG)EN-DC wherein either MN and SN have different DRX cycles, or on-duration configured by MN does not contain on-duration configured by SN if their DRX cycles are same.	
<i>utran-ProximityIndication</i> Indicates whether the UE supports proximity indication for UTRAN CSG member cells.	-
<i>utran-SI-AcquisitionForHO</i> Indicates whether the UE supports, upon configuration of si-RequestForHO by the network,	Yes
acquisition and reporting of relevant information using autonomous gaps by reading the SI from a neighbouring UMTS cell.	
<i>v2x-BandwidthClassTxSL, v2x-BandwidthClassRxSL</i> The bandwidth class for V2X sidelink transmission and reception supported by the UE as defined in TS 36.101 [42], Table 5.6G.1-3.	-
The UE explicitly includes all the supported bandwidth class combinations for V2X sidelink transmission or reception in the band combination signalling. Support for one bandwidth class	
does not implicitly indicate support for another bandwidth class. v2x-eNB-Scheduled Indicates whether the UE supports transmitting PSCCH/PSSCH using dynamic scheduling,	-
SPS in eNB scheduled mode for V2X sidelink communication, reporting SPS assistance information and the UE supports maximum transmit power associated with Power class 3 V2X	

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>v2x-EnhancedHighReception</i> Indicates whether the UE supports reception of 30 PSCCH in a subframe and decoding of 204 RBs per subframe counting both PSCCH and PSSCH in a band for V2X sidelink	-
communication.	
v2x-HighPower	-
Indicates whether the UE supports maximum transmit power associated with Power class 2 V2X UE for V2X sidelink transmission in a band, see TS 36.101 [42].	
v2x-HighReception Indicates whether the UE supports reception of 20 PSCCH in a subframe and decoding of 136 RBs per subframe counting both PSCCH and PSSCH in a band for V2X sidelink	-
communication.	
<i>v2x-nonAdjacentPSCCH-PSSCH</i> Indicates whether the UE supports transmission and reception in the configuration of non- adjacent PSCCH and PSSCH for V2X sidelink communication.	-
v2x-numberTxRxTiming	-
Indicates the number of multiple reference TX/RX timings counted over all the configured sidelink carriers for V2X sidelink communication.	
v2x-SensingReportingMode3	-
Indicates whether the UE supports sensing measurements and reporting of measurement results in eNB scheduled mode for V2X sidelink communication.	
v2x-SupportedBandCombinationList	
Indicates the supported band combination list on which the UE supports simultaneous transmission and/or reception of V2X sidelink communication.	
v2x-SupportedTxBandCombListPerBC, v2x-SupportedRxBandCombListPerBC	-
Indicates, for a particular band combination of EUTRA, the supported band combination list	
among v2x-SupportedBandCombinationList on which the UE supports simultaneous transmission or reception of EUTRA and V2X sidelink communication respectively. The first bit refers to the first entry of v2x-SupportedBandCombinationList, with value 1 indicating V2X	
sidelink transmission/reception is supported. v2x-TxWithShortResvInterval	
Indicates whether the UE supports 20 ms and 50 ms resource reservation periods for UE autonomous resource selection and eNB scheduled resource allocation for V2X sidelink	-
communication. voiceOverPS-HS-UTRA-FDD	
Indicates whether UE supports IMS voice according to GSMA IR.58 profile in UTRA FDD. voiceOverPS-HS-UTRA-TDD128	-
Indicates whether UE supports IMS voice in UTRA TDD 1.28Mcps.	-
<i>ims-VoiceOverNR-PDCP-MCG-Bearer</i> Indicates whether the UE supports IMS voice over NR PDCP with only MCG RLC bearer.	Yes
<i>ims-VoiceOverNR-PDCP-SCG-Bearer</i> Indicates whether the UE supports IMS voice over NR PDCP with only SCG RLC bearer when configured with EN-DC.	Yes
<i>ims-VoNR-PDCP-SCG-NGENDC</i> Indicates whether the UE supports IMS voice over NR PDCP with only SCG RLC bearer when configured with NGEN-DC.	Yes
whiteCellList Indicates whether the UE supports EUTRA white cell listing to limit the set of cells applicable	-
for measurements. wlan-IW-RAN-Rules	-
Indicates whether the UE supports RAN-assisted WLAN interworking based on access network selection and traffic steering rules.	
wlan-IW-ANDSF-Policies Indicates whether the UE supports RAN-assisted WLAN interworking based on ANDSF	-
policies. wlan-MAC-Address	-
Indicates the WLAN MAC address of this UE. wlan-PeriodicMeas	-
Indicates whether the UE supports periodic reporting of WLAN measurements. wlan-ReportAnyWLAN	-
Indicates whether the UE supports reporting of WLANs not listed in the measObjectWLAN. wlan-SupportedDataRate	
Indicates the maximum WLAN data rate supported by the UE over all LWA bearers. Actual value of supported data rate is field value * 10 Mbps (i.e., value 1 corresponds to 10 Mbps, value 2 corresponds to 20 Mbps and so on).	-

UE-EUTRA-Capability field descriptions	FDD/ TDD diff
<i>zp-CSI-RS-AperiodicInfo</i> Indicates whether the UE supports aperiodic ZP-CSI-RS transmission for the indicated transmission mode.	FFS

- NOTE 1: The IE *UE-EUTRA-Capability* does not include AS security capability information, since these are the same as the security capabilities that are signalled by NAS. Consequently, AS need not provide "man-in-the-middle" protection for the security capabilities.
- NOTE 2: The column FDD/ TDD diff indicates if the UE is allowed to signal, as part of the additional capabilities for an XDD mode i.e. within *UE-EUTRA-CapabilityAddXDD-Mode-xNM*, a different value compared to the value signalled elsewhere within *UE-EUTRA-Capability* (i.e. the common value, supported for both XDD modes). A '-' is used to indicate that it is not possible to signal different values (used for fields for which the field description is provided for other reasons). Annex E specifies for which TDD and FDD serving cells a UE supporting TDD/FDD CA shall support a capability for which it indicates support within the capability signalling.
- NOTE 2a: From REL-15 onwards, the UE is not allowed to signal different values for FDD and TDD unless yes is indicated in column FDD/ TDD diff (i.e. no need to introduce field description solely for the purpose of indicate no).
- NOTE 3: The BandCombinationParameters for the same band combination can be included more than once.
- NOTE 4: UE CA and measurement capabilities indicate the combinations of frequencies that can be configured as serving frequencies.
- NOTE 5: The grouping of the cells to the first and second cell group, as indicated by *supportedCellGrouping*, is shown in the table below. The leading / leftmost bit of *supportedCellGrouping* corresponds to the Bit String Position 1.

Nr of Band Entries:	5	4	3
Length of Bit-String:	15	7	3
Bit String Position		uping option oup, 1= seco group)	
1	00001	0001	001
2	00010	0010	010
3	00011	0011	011
4	00100	0100	
5	00101	0101	
6	00110	0110	
7	00111	0111	
8	01000		
9	01001		
10	01010		
11	01011		
12	01100		
13	01101		
14	01110		
15	01111		

- NOTE 6: UE includes the *intraBandContiguousCC-InfoList-r12* also for bandwidth class A because of the presence conditions in *BandCombinationParameters-v1270*. For example, if UE supports CA_1A_41D band combination, if UE includes the field *intraBandContiguousCC-InfoList-r12* for band 41, the UE includes *intraBandContiguousCC-InfoList-r12* also for band 1.
- NOTE 7: For a UE that indicates release X in field *accessStratumRelease* but supports a feature specified in release X+ N (i.e. early UE implementation), the ASN.1 comprehension requirement are specified in Annex F.
- NOTE 8: For a UE that does not include *mimo-WeightedLayersCapabilities-r13*, or for the case with no CC configured with FD-MIMO, the FD-MIMO processing capability condition is not applicable (i.e. considered as satisfied). For a UE that includes *mimo-WeightedLayersCapabilities-r13*, the FD-MIMO processing capability condition is satisfied if the equation 4.3.28.13-1 in TS 36.306 [5] is satisfied.

## UE-RadioPagingInfo

The UE-RadioPagingInfo IE contains UE capability information needed for paging.

### UE-RadioPagingInfo information element

UE-RadioPagingInfo-r12 ::= ue-Category-v1250	SEQUENCE { INTEGER (0)	OPTIONAL,		
[[ ue-CategoryDL-v1310 ce-ModeA-r13 ce-ModeB-r13	ENUMERATED ENUMERATED ENUMERATED	<pre>{m1} OPTION {true} OPTION {true} OPTION</pre>	NAL,	
]], [[ wakeUpSignal-r15 wakeUpSignal-TDD-r15 wakeUpSignalMinGap-eDRX-r15 OPTIONAL,	ENUMERATED ENUMERATED ENUMERATED {ms4		NAL,	
wakeUpSignalMinGap-eDRX-TDD-r15	ENUMERATED {ms4	10, ms240, ms100	)0, ms2000}	OPTIONAL

-- ASN1STOP

-- ASN1START

### UE-RadioPagingInfo field descriptions

*ce-ModeA, ce-ModeB* Indicates whether the UE supports operation in CE mode A and/or B, as specified in TS 36.211 [21] and TS 36.213 [23].

#### ue-Category, ue-CategoryDL

UE category as defined in TS 36.306 [5]. A category M2 UE shall always include the field *ue-CategoryDL-v1310* in this version of the specification.

### wakeUpSignal, wakeUpSignal-TDD

Indicates whether the UE supports WUS for paging, as specified in TS 36.213 [22] and TS 36.304 [4]. If this field is included, the minimum gap between WUS and associated PO for DRX is fixed as 40 ms. *wakeUpSignalMinGap-eDRX, wakeUpSignalMinGap-eDRX-TDD* 

Indicates the minimum gap the UE supports between WUS and associated PO for eDRX as specified in TS 36.213 [22] and TS 36.304 [4]. Value ms40 corresponds to 40 ms, ms240 corresponds to 240 ms and so on. If this field is included, the UE shall also indicate support of WUS for paging.

## UE-TimersAndConstants

The IE *UE-TimersAndConstants* contains timers and constants used by the UE in either RRC_CONNECTED or RRC_IDLE.

### UE-TimersAndConstants information element

-- ASN1START

UE-TimersAndConstants ::=	SEQUENCE {
t300	ENUMERATED {
	ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,
	ms2000},
t301	ENUMERATED {
	ms100, ms200, ms300, ms400, ms600, ms1000, ms1500,
	ms2000},
t310	ENUMERATED {
	ms0, ms50, ms100, ms200, ms500, ms1000, ms2000},
n310	ENUMERATED {
	n1, n2, n3, n4, n6, n8, n10, n20},
t311	ENUMERATED {
	ms1000, ms3000, ms5000, ms10000, ms15000,
	ms20000, ms30000},
n311	ENUMERATED {
	n1, n2, n3, n4, n5, n6, n8, n10},
•••,	
[[ t300-v1310	ENUMERATED {
•••	ms2500, ms3000, ms3500, ms4000, ms5000, ms6000, ms8000,
	ms10000} OPTIONAL, Need OR
t301-v1310	ENUMERATED {
	ms2500, ms3000, ms3500, ms4000, ms5000, ms6000, ms8000,
	ms10000} OPTIONAL Need OR
]],	
[[ t310-v1330	ENUMERATED {ms4000, ms6000}
11 0010 11000	OPTIONAL Need OR
11,	
[[ t300-r15	ENUMERATED {ms4000, ms6000, ms8000, ms10000, ms15000,
11 0000 110	ms25000, ms40000, ms60000} OPTIONAL Cond EDT
11	
}	
,	

-- ASN1STOP

-- ASN1START

#### UE-TimersAndConstants field descriptions

#### *n3xy* Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on.

*t3xy* Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms50 corresponds with 50 ms and so on. EUTRAN includes an extended value *t3xy-v1310 and t3xy-v1330* only in the Bandwidth Reduced (BR) version of the SIB. UEs that support Coverage Enhancement (CE) mode B shall use the extended values *t3xy-v1310 and t3xy-v1330*, if present, and ignore the value signaled by *t3xy* (without the suffix). *t300-r15* is only applicable for EDT. UE performing EDT shall use *t300-r15*, if present.

Conditional presence	Explanation
EDT	The field is optionally present, Need OR, if edt-Parameters is present in SIB2; otherwise
	the field is not present and the UE shall delete any existing value for this field.

# VisitedCellInfoList

The IE *VisitedCellInfoList* includes the mobility history information of maximum of 16 most recently visited cells or time spent outside E-UTRA. The most recently visited cell is stored first in the list. The list includes cells visited in RRC_IDLE and RRC_CONNECTED states.

## VisitedCellInfoList information element

```
VisitedCellInfoList-r12 ::= SEQUENCE (SIZE (1..maxCellHistory-r12)) OF VisitedCellInfo-r12
VisitedCellInfo-r12 ::=
                                    SEQUENCE {
   visitedCellId-r12
                                       CHOICE {
       cellGlobalId-r12
                                                CellGlobalIdEUTRA,
        pci-arfcn-r12
                                                SEOUENCE {
           physCellId-r12
                                                    PhysCellId,
                                                    ARFCN-ValueEUTRA-r9
            carrierFreq-r12
        }
                                                                     OPTIONAL,
    timeSpent-r12
                                        INTEGER (0..4095),
```

}

-- ASN1STOP

timeSpent

#### VisitedCellInfoList field descriptions

This field indicates the duration of stay in the cell or outside E-UTRA approximated to the closest second. If the duration of stay exceeds 4095s, the UE shall set it to 4095s.

## WLAN-OffloadConfig

The IE *WLAN-OffloadConfig* includes information for traffic steering between E-UTRAN and WLAN. The fields are applicable to both RAN-assisted WLAN interworking based on access network selection and traffic steering rules and RAN-assisted WLAN interworking based on ANDSF policies unless stated otherwise in the field description.

### WLAN-OffloadConfig information element

```
-- ASN1START
WLAN-OffloadConfig-r12 ::=
                                         SEQUENCE {
    thresholdRSRP-r12
                                             SEQUENCE {
                                                 RSRP-Range,
        thresholdRSRP-Low-r12
        thresholdRSRP-High-r12
                                                 RSRP-Range
                                                                          OPTIONAL, -- Need OR
    thresholdRSRQ-r12
                                            SEQUENCE {
        thresholdRSRO-Low-r12
                                                 RSRQ-Range,
        thresholdRSRQ-High-r12
                                                 RSRQ-Range
                                                                          OPTIONAL, -- Need OR
    thresholdRSRQ-OnAllSymbolsWithWB-r12
                                            SEQUENCE {
        thresholdRSRO-OnAllSymbolsWithWB-Low-r12
                                                             RSRO-Range,
        thresholdRSRQ-OnAllSymbolsWithWB-High-r12
                                                             RSRQ-Range
                                                                          OPTIONAL, -- Need OP
    thresholdRSRQ-OnAllSymbols-r12
                                             SEQUENCE {
         thresholdRSRQ-OnAllSymbolsLow-r12
                                                             RSRO-Range,
         thresholdRSRQ-OnAllSymbolsHigh-r12
                                                             RSRQ-Range
                                                                          OPTIONAL, -- Need OP
    thresholdRSRQ-WB-r12
                                             SEQUENCE {
        thresholdRSRQ-WB-Low-r12
                                                             RSRQ-Range,
                                                             RSRQ-Range
        thresholdRSRQ-WB-High-r12
    1
                                                                          OPTIONAL, -- Need OP
    thresholdChannelUtilization-r12
                                            SEQUENCE {
                                               INTEGER (0..255),
        thresholdChannelUtilizationLow-r12
        thresholdChannelUtilizationHigh-r12
                                               INTEGER (0..255)
                                                                          OPTIONAL, -- Need OR
    thresholdBackhaul-Bandwidth-r12
                                           SEQUENCE {
        thresholdBackhaulDL-BandwidthLow-r12
thresholdBackhaulDL-BandwidthHigh-r12
                                                WLAN-backhaulRate-r12,
                                                WLAN-backhaulRate-r12,
        thresholdBackhaulUL-BandwidthLow-r12
                                                 WLAN-backhaulRate-r12,
                                                WLAN-backhaulRate-r12
        thresholdBackhaulUL-BandwidthHigh-r12
                                                                         OPTIONAL, -- Need OR
                                                 SEQUENCE {
    thresholdWLAN-RSSI-r12
                                                     INTEGER (0..255),
        thresholdWLAN-RSSI-Low-r12
        thresholdWLAN-RSSI-High-r12
                                                     INTEGER (0..255)
                                                                         OPTIONAL, -- Need OR
                                                                         OPTIONAL, -- Need OR
                                            BIT STRING (SIZE (16))
    offloadPreferenceIndicator-r12
                                                                         OPTIONAL, -- Need OR
    t-SteeringWLAN-r12
                                            T-Reselection
}
WLAN-backhaulRate-r12 ::=
                                            ENUMERATED
                                         {r0, r4, r8, r16, r32, r64, r128, r256, r512,
                                         r1024, r2048, r4096, r8192, r16384, r32768, r65536, r131072,
                                         r262144, r524288, r1048576, r2097152, r4194304, r8388608,
                                         r16777216, r33554432, r67108864, r134217728, r268435456,
                                         r536870912, r1073741824, r2147483648, r4294967296}
```

-- ASN1STOP

WLAN-OffloadConfig field descripti offloadPreferenceIndicator	
Indicates the offload preference indicator. Parameter: OPI in TS 24.312 [66].	Only applicable to RAN-assisted WLAN
interworking based on ANDSF policies.	
thresholdBackhaulDLBandwidth-High	
Indicates the backhaul available downlink bandwidth threshold used by the L	IE for traffic steering to WLAN
Parameter: Thresh _{BackhRateDLWLAN, High} in TS 36.304 [4]. Value in kilobits/secor	
thresholdBackhaulDLBandwidth-Low	IF for troffic at a ving to F LITDAN
Indicates the backhaul available downlink bandwidth threshold used by the L	
Parameter: ThreshBackhRateDLWLAN, Low in TS 36.304 [4]. Value in kilobits/secon	a. value in corresponds to in kops.
thresholdBackhaulULBandwidth-High	
Indicates the backhaul available uplink bandwidth threshold used by the UE	
ThreshBackhRateULWLAN, High in TS 36.304 [4]. Value in kilobits/second. Value rN	corresponds to N kbps.
thresholdBackhaulULBandwidth-Low	
Indicates the backhaul available uplink bandwidth threshold used by the UE	
Parameter: ThreshBackhRateULWLAN, Low in TS 36.304 [4]. Value in kilobits/secon	d. Value rN corresponds to N kbps.
thresholdChannelUtilization-High	· · · · · · · · · · · · · · · · · · ·
Indicates the WLAN channel utilization (BSS load) threshold used by the UE	for traffic steering to E-UTRAN.
Parameter: Thresh _{ChUtilWLAN, High} in TS 36.304 [4].	
thresholdChannelUtilization-Low	
Indicates the WLAN channel utilization (BSS load) threshold used by the UE	for traffic steering to WLAN. Parameter:
ThreshchutilWLAN, Low in TS 36.304 [4].	
thresholdRSRP-High	
Indicates the RSRP threshold (in dBm) used by the UE for traffic steering to	E-UTRAN. Parameter:
Thresh _{ServingOffloadWLAN, High} P in TS 36.304 [4].	
threshold RSRP-Low	
Indicates the RSRP threshold (in dBm) used by the UE for traffic steering to	WLAN. Parameter: ThreshServingOffloadWLA
LowP in TS 36.304 [4].	
thresholdRSRQ-High, thresholdRSRQ-OnAllSymbolsHigh, thresholdRS	RQ-WB-High, thresholdRSRQ-
OnAllSymbolsWithWB-High	3,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Indicates the RSRQ threshold (in dB) used by the UE for traffic steering to E	-UTRAN. Parameter:
ThreshServingOffloadWLAN, HighQ in TS 36.304 [4]. The UE shall only apply one of t	
OnAllSymbolsWithWB-High, thresholdRSRQ-OnAllSymbolsHigh, thresholdF	
as present in wlan-OffloadConfigCommon and forward this to upper layer. No	
thresholdRSRQ-Low, thresholdRSRQ-OnAllSymbolsLow, thresholdRSR	
OnAllSymbolsWithWB-Low	
Indicates the RSRQ threshold (in dB) used by the UE for traffic steering to W	/I AN Parameter: Threshear in rother that will an
$_{LowQ}$ in TS 36.304 [4].	
The UE shall only apply one of threshold values of thresholdRSRQ-OnAllSyl	mbolsWithWB-Low thresholdRSRO-
OnAllSymbolsLow, thresholdRSRQ-WB-Low and thresholdRSRQ-Low as pro-	
forward this to upper layer. NOTE 1.	
thresholdWLAN-RSSI-High	
	ANI Parameter: Threehouses in To
Indicates the WLAN RSSI threshold used by the UE for traffic steering to WL 36.304 [4]. Value 0 corresponds to -128dBm, 1 corresponds to -127dBm and	
	1 50 011.
thresholdWLAN-RSSI-Low	
Indicates the WLAN RSSI threshold used by the UE for traffic steering to E-U	
TS 36.304 [4]. Value 0 corresponds to -128dBm, 1 corresponds to -127dBm	and so on.
t-SteeringWLAN	
Indicates the timer value during which the rules should be fulfilled before star	
and WLAN. Parameter: Tsteering _{WLAN} in TS 36.304 [4]. Only applicable to RA	AN-assisted WLAN interworking based o
access network selection and traffic steering rules.	

NOTE 1: Within SIB17, E-UTRAN includes the fields corresponding to same RSRQ types as included in SIB1. E.g. if E-UTRAN includes *q-QualMinRSRQ-OnAllSymbols* in SIB1 it also includes *thresholdRSRQ-OnAllSymbols* in SIB17. Within the *RRCConnectionReconfiguration* message E-UTRAN only includes *thresholdRSRQ*, setting the value according to the RSRQ type used for E-UTRAN. The UE shall apply the RSRQ fields (RSRQ threshold, high and low) corresponding to one RSRQ type i.e. the same as it applies for E-UTRAN.

# 6.3.7 MBMS information elements

## MBMS-NotificationConfig

The IE *MBMS-NotificationConfig* specifies the MBMS notification related configuration parameters, that are applicable for all MBSFN areas.

### MBMS-NotificationConfig information element

ADNIDIANI	
<pre>MBMS-NotificationConfig-r9 ::=     notificationRepetitionCoeff-r9     notificationOffset-r9     notificationSF-Index-r9 }</pre>	SEQUENCE { ENUMERATED {n2, n4}, INTEGER (010), INTEGER (16)
<pre>MBMS-NotificationConfig-v1430 ::=     notificationSF-Index-v1430 }</pre>	SEQUENCE { INTEGER (710)
ASN1STOP	

MBMS-NotificationConfig field descriptions

#### notificationOffset

-- ASN1START

Indicates, together with the *notificationRepetitionCoeff*, the radio frames in which the MCCH information change notification is scheduled i.e. the MCCH information change notification is scheduled in radio frames for which: SFN mod notification repetition period = *notificationOffset*.

## notificationRepetitionCoeff

Actual change notification repetition period common for all MCCHs that are configured= shortest modification period/ notificationRepetitionCoeff. The 'shortest modificaton period' corresponds with the lowest value of *mcch-ModificationPeriod* of all MCCHs that are configured. Value n2 corresponds to coefficient 2, and so on.

### notificationSF-Index

Indicates the subframe used to transmit MCCH change notifications on PDCCH. FDD: Value 1, 2, 3, 4, 5 and 6 correspond with subframe #1, #2, #3 #6, #7, and #8 respectively. Value 7, 8, 9 and 10 correspond with subframe #0, #4, #5 and #9 respectively. If *notificationSF-Index-v1430* is included, UE ignores *notificationSF-Index-r9*. TDD: Value 1, 2, 3, 4, and 5 correspond with subframe #3, #4, #7, #8, and #9 respectively.

## MBMS-ServiceList

The IE MBMS-ServiceList provides the list of MBMS services which the UE is receiving or interested to receive.

### **MBMS-ServiceList** information element

```
-- ASN1START
MBMS-ServiceList-r13 ::= SEQUENCE (SIZE (0..maxMBMS-ServiceListPerUE-r13)) OF MBMS-
ServiceInfo-r13
MBMS-ServiceInfo-r13 ::= SEQUENCE {
   tmgi-r13 TMGI-r9
}
-- ASN1STOP
```

## – MBSFN-Areald

__ <u>AGN1</u>GTADT

The IE *MBSFN-Areald* identifies an MBSFN area by means of a locally unique value at lower layers i.e. it concerns parameter  $N_{\rm ID}^{\rm MBSFN}$  in TS 36.211 [21], clause 6.10.2.1.

## **MBSFN-Areald** information element

MBSFN-AreaId-r12 ::=	INTEGER (0255)
ASN1STOP	

-- ASN1START

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## MBSFN-AreaInfoList

The IE *MBSFN-AreaInfoList* contains the information required to acquire the MBMS control information associated with one or more MBSFN areas.

### MBSFN-AreaInfoList information element

```
MBSFN-AreaInfoList-r9 ::=
                                           SEQUENCE (SIZE(1..maxMBSFN-Area)) OF MBSFN-AreaInfo-r9
MBSFN-AreaInfo-r9 ::=
                                            SEQUENCE {
    mbsfn-AreaId-r9
non-MBSFNregionLength
notificationIndicator-r9
                                             MBSFN-AreaId-r12,
                                                  ENUMERATED {s1, s2},
                                                 INTEGER (0..7),
         IffeationMetricSEQUENCEh-Config-r9SEQUENCEmcch-RepetitionPeriod-r9ENUMERATED {rf32, rf64, rf128mcch-Offset-r9INTEGER (0..10),mcch-ModificationPeriod-r9ENUMERATED {rf512, rf1024},sf-AllocInfo-r9BIT STRING (SIZE(6)),signallingMCS-r9ENUMERATED {n2, n7, n13, n19}
    mcch-Config-r9
                                                 ENUMERATED {rf32, rf64, rf128, rf256},
     },
       . . ,
                               SEQUENCE {
     [[ mcch-Config-r14
              mcch-RepetitionPeriod-v1430 ENUMERATED {rf1, rf2, rf4, rf8,
                                                rf16 } OPTIONAL, -- Need OR
              mcch-ModificationPeriod-v1430 ENUMERATED {rf1, rf2, rf4, rf8, rf16, rf32, rf64, rf128,
                                                      rf256, spare7}
                                                                                               OPTIONAL -- Need OR
                                                                                                              -- Need OR
                                                                                               OPTIONAL,
          }
                                                                                                              -- Need OR
          subcarrierSpacingMBMS-r14 ENUMERATED {khz-7dot5, khz-1dot25} OPTIONAL
     ]]
}
-- ASN1STOP
```

MBSFN-AreaInfoList field descriptions
mcch-ModificationPeriod
Defines periodically appearing boundaries, i.e. radio frames for which SFN mod <i>mcch-ModificationPeriod</i> = 0. The contents of different transmissions of MCCH information can only be different if there is at least one such boundary inbetween them. In case <i>mcch-ModificationPeriod-v1430</i> is configured, the UE shall ignore the <i>mcch-ModificationPeriod-v1430</i> is configured.
mcch-Offset
Indicates, together with the <i>mcch-RepetitionPeriod</i> , the radio frames in which MCCH is scheduled i.e. MCCH is scheduled in radio frames for which: SFN mod <i>mcch-RepetitionPeriod</i> = <i>mcch-Offset</i> .
mcch-RepetitionPeriod
Defines the interval between transmissions of MCCH information, in radio frames, Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. In case <i>mcch-RepetitionPeriod-v1430</i> is configured, the UE shall ignore the <i>mcch-RepetitionPeriod-r9</i> .
non-MBSFNregionLength
Indicates how many symbols from the beginning of the subframe constitute the non-MBSFN region. This value applies in all subframes of the MBSFN area used for PMCH transmissions as indicated in the MSI. The values s1 and s2 correspond with 1 and 2 symbols, respectively: see TS 36.211 [21], Table 6.7-1.
notificationIndicator
Indicates which PDCCH bit is used to notify the UE about change of the MCCH applicable for this MBSFN area. Value 0 corresponds with the least significant bit as defined in TS 36.212 [22], clause 5.3.3.1 and so on.
<ul> <li>sf-AllocInfo</li> <li>Indicates the subframes of the radio frames indicated by the mcch-RepetitionPeriod and the mcch-Offset, that may carry MCCH. Value "1" indicates that the corresponding subframe is allocated. The following mapping applies:</li> <li>FDD: The first/ leftmost bit defines the allocation for subframe #1 of the radio frame indicated by mcch-RepetitionPeriod and mcch-Offset, the second bit for #2, the third bit for #3, the fourth bit for #6, the fifth bit for #7 and the sixth bit for #8.</li> <li>TDD: The first/leftmost bit defines the allocation for subframe #3 of the radio frame indicated by mcch-RepetitionPeriod and mcch-Offset, the second bit for #4, third bit for #7, fourth bit for #8, fifth bit for #9. Uplink</li> </ul>
subframes are not allocated. The last bit is not used.
signallingMCS Indicates the MCS applicable for the subframes indicated by the field <i>sf-AllocInfo</i> and for each (P)MCH that is configured for this MBSFN area, for the first subframe allocated to the (P)MCH within each MCH scheduling period (which may contain the MCH scheduling information provided by MAC). Value n2 corresponds with the value 2 for
parameter ^I _{MCS} in TS 36.213 [23], Table 7.1.7.1-1, and so on.
<i>subcarrierSpacingMBMS</i> The value indicates subcarrier spacing for MBSFN subframes and khz-7dot5 refers to 7.5kHz subcarrier spacing and khz-1dot25 refers to 1.25 kHz subcarrier spacing as defined in TS36.211 [21], clause 6.12. These subframes do not have non-MBSFN region. If <i>subcarrierSpacingMBMS</i> is present, then <i>non-MBSFNregionLength</i> shall be ignored. EUTRAN configures parameter <i>subcarrierSpacingMBMS</i> only when the MBSFN subframes have subcarrier spacing other than 15kHz.

# MBSFN-SubframeConfig

-- ASN1START

The IE MBSFN-SubframeConfig defines subframes that are reserved for MBSFN in downlink.

### **MBSFN-SubframeConfig** information element

```
SEM-SubframeConfig ::=SEQUENCE {radioframeAllocationPeriodENUMERATED {n1, n2, n4, n8, n16, n32},subframeAllocationINTEGER (0..7),oneFromeCHOICE {
MBSFN-SubframeConfig ::=
           oneFrame
                                                                 BIT STRING (SIZE(6)),
           fourFrames
                                                                  BIT STRING (SIZE(24))
    }
}
MBSFN-SubframeConfig-v1430 ::= SEQUENCE {
subframeAllocation-v1430 CHOICE {
oneFrame-v1430 BIT STRING (SIZE(2)),
coneFrame-v1430 BIT STRING (SIZE(2)),
            fourFrames-v1430
                                                                 BIT STRING (SIZE(8))
      }
}
-- ASN1STOP
```

MBSFN-SubframeConfig field descriptions
fourFrames
A bit-map indicating MBSFN subframe allocation in four consecutive radio frames, "1" denotes that the corresponding
subframe is allocated for MBSFN. The bitmap is interpreted as follows:
FDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes
#1, #2, #3, #6, #7, and #8 in the sequence of the four radio-frames.
TDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes
#3, #4, #7, #8, and #9 in the sequence of the four radio-frames. The last four bits are not used. E-UTRAN allocates
uplink subframes only if eimta-MainConfig is configured.
fourFrames-v1430
A bit-map indicating MBSFN subframe allocation in four consecutive radio frames, "1" denotes that the corresponding
subframe is allocated for MBSFN. The bitmap is interpreted as follows:
FDD: Starting from the first radioframe and from the first/leftmost bit in the bitmap, the allocation applies to subframes
#4 and #9 in the sequence of the four radio-frames.
oneFrame
"1" denotes that the corresponding subframe is allocated for MBSFN. The following mapping applies:
FDD: The first/leftmost bit defines the MBSFN allocation for subframe #1, the second bit for #2, third bit for #3, fourth
bit for #6, fifth bit for #7, sixth bit for #8.
TDD: The first/leftmost bit defines the allocation for subframe #3, the second bit for #4, third bit for #7, fourth bit for #8,
fifth bit for #9. E-UTRAN allocates uplink subframes only if <i>eimta-MainConfig</i> is configured. The last bit is not used.
oneFrame-v1430
"1" denotes that the corresponding subframe is allocated for MBSFN. The following mapping applies:
FDD: The first/leftmost bit defines the MBSFN allocation for subframe #4 and the second bit for #9.
radioFrameAllocationPeriod, radioFrameAllocationOffset
Radio-frames that contain MBSFN subframes occur when equation SFN mod radioFrameAllocationPeriod =
radioFrameAllocationOffset is satisfied. Value n1 for radioframeAllocationPeriod denotes value 1, n2 denotes value 2,
and so on. When fourFrames is used for subframeAllocation, the equation defines the first radio frame referred to in
the description below. Values <i>n1</i> and <i>n</i> 2 are not applicable when <i>fourFrames</i> is used.
subframeAllocation
Defines the subframes that are allocated for MBSFN within the radio frame allocation period defined by the
radioFrameAllocationPeriod and the radioFrameAllocationOffset.

# PMCH-InfoList

The IE *PMCH-InfoList* specifies configuration of all PMCHs of an MBSFN area, while IE *PMCH-InfoListExt* includes additional PMCHs, i.e. extends the PMCH list using the general principles specified in 5.1.2. The information provided for an individual PMCH includes the configuration parameters of the sessions that are carried by the concerned PMCH. For all PMCH that E-UTRAN includes in *PMCH-InfoList*, the list of ongoing sessions has at least one entry.

## PMCH-InfoList information element

```
-- ASN1START
PMCH-InfoList-r9 ::=
                                     SEQUENCE (SIZE (0..maxPMCH-PerMBSFN)) OF PMCH-Info-r9
PMCH-InfoListExt-r12 ::=
                                    SEQUENCE (SIZE (0..maxPMCH-PerMBSFN)) OF PMCH-InfoExt-r12
PMCH-Info-r9 ::=
                                     SEQUENCE {
   pmch-Config-r9
                                         PMCH-Config-r9,
    pmch-Contig-r9 PMCH-Contig-r9,
mbms-SessionInfoList-r9 MBMS-SessionInfoList-r9,
    . . .
}
PMCH-InfoExt-r12 ::=
                                    SEQUENCE {
   pmch-Config-r12
                                         PMCH-Config-r12,
    pmch-Config-r12
mbms-SessionInfoList-r12
                                         MBMS-SessionInfoList-r9,
    . . .
}
MBMS-SessionInfoList-r9 ::=
                                SEQUENCE (SIZE (0..maxSessionPerPMCH)) OF MBMS-SessionInfo-r9
MBMS-SessionInfo-r9 ::= SEQUENCE {
tmgi-r9 TM
                                         TMGI-r9,
    sessionId-r9
                                         OCTET STRING (SIZE (1)) OPTIONAL, -- Need OR
    logicalChannelIdentity-r9
                                         INTEGER (0..maxSessionPerPMCH-1),
    . . .
}
PMCH-Config-r9 ::=
                                    SEQUENCE {
```

```
sf-AllocEnd-r9
                                        INTEGER (0..1535),
    dataMCS-r9
                                        INTEGER (0..28),
   mch-SchedulingPeriod-r9
                                    ENUMERATED {
                                        rf8, rf16, rf32, rf64, rf128, rf256, rf512, rf1024},
}
                                    SEQUENCE {
PMCH-Config-r12 ::=
                                        INTEGER (0..1535),
    sf-AllocEnd-r12
                                        CHOICE {
    dataMCS-r12
       normal-r12
                                            INTEGER (0..28),
                                            INTEGER (0..27)
       higerOrder-r12
    mch-SchedulingPeriod-r12
                                    ENUMERATED {
                                        rf4, rf8, rf16, rf32, rf64, rf128, rf256, rf512, rf1024},
    [[ mch-SchedulingPeriod-v1430
                                        ENUMERATED {rf1, rf2}
                                                                        OPTTONAL.
                                                                                  -- Need OR
    ]]
}
                                SEOUENCE {
TMGI-r9 ::=
   plmn-Id-r9
                                        CHOICE {
       plmn-Index-r9
                                            INTEGER (1..maxPLMN-r11),
       explicitValue-r9
                                            PLMN-Identity
    }.
    serviceId-r9
                                        OCTET STRING (SIZE (3))
}
-- ASN1STOP
```

#### PMCH-InfoList field descriptions

#### dataMCS

Indicates the value for parameter  $I_{MCS}$  in TS 36.213 [23], which defines the MCS applicable for the subframes of this (P)MCH as indicated by the field *commonSF-Alloc*. Value *normal* corresponds to Table 7.1.7.1-1 and value *higherOrder* corresponds to Table 7.1.7.1-1A. The MCS does however neither apply to the subframes that may carry MCCH i.e. the subframes indicated by the field *sf-AllocInfo* within *SystemInformationBlockType13* nor for the first subframe allocated to this (P)MCH within each MCH scheduling period (which may contain the MCH scheduling information provided by MAC).

## mch-SchedulingPeriod

Indicates the MCH scheduling period i.e. the periodicity used for providing MCH scheduling information at lower layers (MAC) applicable for an MCH. Value rf8 corresponds to 8 radio frames, rf16 corresponds to 16 radio frames and so on. The *mch-SchedulingPeriod* starts in the radio frames for which: SFN mod *mch-SchedulingPeriod* = 0. E-UTRAN configures *mch-SchedulingPeriod* of the (P)MCH listed first in *PMCH-InfoList* to be smaller than or equal to *mcch-RepetitionPeriod*. In case *mch-SchedulingPeriod-v1430* is configured, the UE shall ignore *mch-SchedulingPeriod-r12*.

## plmn-Index

Index of the entry across the *plmn-IdentityList* fields within SystemInformationBlockType1.

#### sessionId

Indicates the optional MBMS Session Identity, which together with TMGI identifies a transmission or a possible retransmission of a specific MBMS session: see TS 29.061 [51], clauses 20.5, 17.7.11, and 17.7.15. The field is included whenever upper layers have assigned a session identity i.e. one is available for the MBMS session in E-UTRAN.

#### serviceld

Uniquely identifies the identity of an MBMS service within a PLMN. The field contains octet 3- 5 of the IE Temporary Mobile Group Identity (TMGI) as defined in TS 24.008 [49]. The first octet contains the third octet of the TMGI, the second octet contains the fourth octet of the TMGI and so on.

## sf-AllocEnd

Indicates the last subframe allocated to this (P)MCH within a period identified by field *commonSF-AllocPeriod*. The subframes allocated to (P)MCH corresponding with the nth entry in *pmch-InfoList* are the subsequent subframes starting from either the next subframe after the subframe identified by *sf-AllocEnd* of the (n-1)th listed (P)MCH or, for n=1, the first subframe defined by field *commonSF-Alloc*, through the subframe identified by *sf-AllocEnd* of the nth listed (P)MCH. Value 0 corresponds with the first subframe defined by field *commonSF-Alloc*.

# 6.3.7a SC-PTM information elements

## – SC-MTCH-InfoList

The IE SC-MTCH-InfoList provides the list of ongoing MBMS sessions transmitted via SC-MRB and for each MBMS session, the associated G-RNTI and scheduling information.

### SC-MTCH-InfoList information element

```
-- ASN1START
SC-MTCH-InfoList-r13 ::=
                                    SEQUENCE (SIZE (0..maxSC-MTCH-r13)) OF SC-MTCH-Info-r13
SC-MTCH-Info-r13 ::=
                                    SEQUENCE
                                                 {
   mbmsSessionInfo-r13
                                            MBMSSessionInfo-r13,
   g-RNTI-r13
                                            BIT STRING(SIZE(16)),
    sc-mtch-schedulingInfo-r13
                                            SC-MTCH-SchedulingInfo-r13
                                                                                 OPTIONAL, -- Need
OP
    sc-mtch-neighbourCell-r13
                                            BIT STRING (SIZE(maxNeighCell-SCPTM-r13)) OPTIONAL, --
Need OP
    [[ p-a-r13
                                            ENUMERATED {
                                                dB-6, dB-4dot77, dB-3, dB-1dot77,
                                                dB0, dB1, dB2, dB3
                                                                       OPTIONAL
                                                                                     -- Need ON
    11
}
MBMSSessionInfo-r13 ::=
                                    SEQUENCE
                                                {
                                            TMGI-r9,
   tmgi-r13
                                            OCTET STRING (SIZE (1))
    sessionId-r13
                                                                       OPTIONAL
                                                                                     -- Need OR
}
SC-MTCH-SchedulingInfo-r13::=
                                    SEQUENCE
                                                 {
   onDurationTimerSCPTM-r13
                                            ENUMERATED {
                                                psf1, psf2, psf3, psf4, psf5, psf6,
                                                psf8, psf10, psf20, psf30, psf40,
                                                psf50, psf60, psf80, psf100,
                                                psf200},
    drx-InactivityTimerSCPTM-r13
                                            ENUMERATED {
                                                psf0, psf1, psf2, psf4, psf8,
                                                psf10, psf20, psf40,
                                                psf80, psf160, ps320,
                                                psf640, psf960,
                                                 psf1280, psf1920, psf2560},
    schedulingPeriodStartOffsetSCPTM-r13
                                            CHOICE {
                                                 INTEGER(0..9),
        sf10
                                                INTEGER(0..19),
        sf20
                                                INTEGER(0..31),
        sf32
        sf40
                                                 INTEGER(0..39),
        sf64
                                                INTEGER(0..63),
        sf80
                                                 INTEGER(0..79),
                                                INTEGER(0..127),
        sf128
        sf160
                                                INTEGER(0..159),
        sf256
                                                 INTEGER(0..255),
       sf320
                                                INTEGER(0..319),
                                                 INTEGER(0..511),
        sf512
        sf640
                                                INTEGER(0..639),
        sf1024
                                                INTEGER(0..1023),
        sf2048
                                                INTEGER(0..2048),
       sf4096
                                                INTEGER(0..4096),
        sf8192
                                                INTEGER(0..8192)
    },
    . . .
}
-- ASN1STOP
```

### SC-MTCH-InfoList field descriptions

### drx-InactivityTimerSCPTM

Timer for SC-MTCH in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf0 corresponds to 0 PDCCH sub-frame and behaviour as specified in 7.3.2 applies, psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on.

## g-RNTI

G-RNTI used to scramble the scheduling and transmission of a SC-MTCH.

### mbmsSessionInfo

Indicates the ongoing MBMS session in a SC-MTCH.

## onDurationTimerSCPTM

Timer for SC-MTCH reception in TS 36.321 [6]. Value in number of PDCCH sub-frames. Value psf1 corresponds to 1 PDCCH sub-frame, psf2 corresponds to 2 PDCCH sub-frames and so on.

### р-а

Parameter:  $P_A''$ , for the SC-MTCH per G-RNTI, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-4dot77 corresponds to -4.77 dB etc.

#### schedulingPeriodStartOffsetSCPTM

SCPTM-SchedulingCycle and SCPTM-SchedulingOffset in TS 36.321 [6]. The value of SCPTM-SchedulingCycle is in number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The value of SCPTM-SchedulingOffset is in number of sub-frames. The E-UTRAN does not configure a maximum value 2048 for sf2048, 4096 for sf4096 or 8192 for sf8192.

#### sc-mtch-neighbourCell

Indicates neighbour cells which also provide this service on SC-MTCH. The first bit is set to 1 if the service is provided on SC-MTCH in the first cell in *scptmNeighbourCellList*, otherwise it is set to 0. The second bit is set to 1 if the service is provided on SC-MTCH in the second cell in *scptmNeighbourCellList*, and so on. If this field is absent, the UE shall assume that this service is not available on SC-MTCH in any neighbour cell.

### sc-mtch-schedulingInfo

DRX information for the SC-MTCH. If this field is absent, the SC-MTCH may be scheduled in any subframe.

## SC-MTCH-InfoList-BR

The IE *SC-MTCH-InfoList-BR* provides the list of ongoing MBMS sessions transmitted via SC-MRB and for each MBMS session, the associated G-RNTI and scheduling information.

## SC-MTCH-InfoList-BR information element

ASN1START		
SC-MTCH-InfoList-BR-r14 ::=	SEQUENCE (SIZE	(0maxSC-MTCH-BR-r14)) OF SC-MTCH-Info-BR-r14
SC-MTCH-Info-BR-r14 ::= sc-mtch-CarrierFreq-r14 mbmsSessionInfo-r14 g-RNTI-r14 sc-mtch-schedulingInfo-r14	MBM BIT	CN-ValueEUTRA-r9, SSessionInfo-r13, STRING(SIZE(16)), -SchedulingInfo-BR-r14 OPTIONAL,
Need OP sc-mtch-neighbourCell-r14	BIT	STRING (SIZE(maxNeighCell-SCPTM-r13)) OPTIONAL,
Need OP		Sinno (Sind (maniergieerr Serin 113)) Sirionin,
mpdcch-Narrowband-SC-MTCH-r1 mpdcch-NumRepetition-SC-MTCH		<pre>INTEGER (1 maxAvailNarrowBands-r13), ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, r256},</pre>
mpdcch-StartSF-SC-MTCH-r14	CHOICE {	
fdd-r14		ENUMERATED {v1, v1dot5, v2, v2dot5, v4, v5, v8, v10},
tdd-r14		ENUMERATED {v1, v2, v4, v5, v8, v10, v20}
<pre>}, mpdcch-PDSCH-HoppingConfig-S mpdcch-PDSCH-CEmodeConfig-SC mpdcch-PDSCH-MaxBandwidth-SC mpdcch-Offset-SC-MTCH-r14</pre>	C-MTCH-r14	<pre>ENUMERATED {on, off}, ENUMERATED {ce-ModeA, ce-ModeB}, ENUMERATED {bwldot4, bw5}, ENUMERATED {zero, oneEighth, oneQuarter, threeEighth, oneHalf, fiveEighth, threeQuarter, sevenEighth},</pre>
p-a-r14		ENUMERATED { dB-6, dB-4dot77, dB-3, dB-1dot77, dB0, dB1, dB2, dB3} OPTIONAL, Need OR
}		
SC-MTCH-SchedulingInfo-BR-r14::=	= SEQUENCE	{

	(
onDurationTimerSCPTM-r14	ENUMERATED {
	psf300, psf400, psf500, psf600,
	psf800, psf1000, psf1200, psf1600},
drx-InactivityTimerSCPTM-r14	ENUMERATED {
	psf0, psf1, psf2, psf4, psf8, psf16,
	psf32, psf64, psf128, psf256, ps512,
	psf1024, psf2048, psf4096, psf8192, psf16384},
schedulingPeriodStartOffsetSCPTM-r14	CHOICE {
sfl0	INTEGER(09),
sf20	INTEGER(019),
sf32	<pre>INTEGER(031),</pre>
sf40	<pre>INTEGER(039),</pre>
sf64	<pre>INTEGER(063),</pre>
sf80	INTEGER(079),
sf128	INTEGER(0127),
sf160	INTEGER(0159),
sf256	INTEGER(0255),
sf320	INTEGER(0319),
sf512	INTEGER(0511),
sf640	INTEGER(0639),
sf1024	INTEGER(01023),
sf2048	INTEGER(02047),
sf4096	INTEGER(04095),
sf8192	INTEGER(08191)
},	
}	
ASN1STOP	

	MTCH-InfoList-BR field descriptions
drx-InactivityTimerSCPTM	
	e in number of MPDCCH sub-frames. Value psf0 corresponds to 0
MPDCCH sub-frame and behaviour as spe	ecified in 7.3.2 applies, psf1 corresponds to 1 MPDCCH sub-frame, psf2
corresponds to 2 MPDCCH sub-frames ar	nd so on.
g-RNTI	
G-RNTI used to scramble the scheduling a	and transmission of a SC-MTCH
mbmsSessionInfo	
Indicates the ongoing MBMS session in a	SC-MTCH.
mpdcch-Narrowband-SC-MTCH	
Narrowband for MPDCCH for SC-MTCH,	see TS 36.213 [23].
mpdcch-NumRepetitions-SC-MTCH	
	tions the UE needs to monitor for SC-MTCH, see TS 36.213 [23].
mpdcch-Offset-SC-MTCH	
1	es for MPDCCH search space for SC-MTCH, see TS 36.213 [23].
mpdcch-PDSCH-CEmodeConfig-SC-M1	
	on for MPDCCH/PDSCH for SC-MTCH, see TS 36.213 [23].
mpdcch-PDSCH-HoppingConfig-SC-M1	
	CCH/PDSCH for SC-MTCH, see TS 36.213 [23].
mpdcch-PDSCH-MaxBandwidth-SC-MT	
	SC-MTCH, see TS 36.213 [23]. Value <i>bw1dot4</i> corresponds to 1.4 MHz
	onds to 5 MHz channel bandwidth. Corresponding maximum TBS are
specified in TS 36.213 [23], clause 7.1.7.2	
mpdcch-StartSF-SC-MTCH	a
	PDCCH search space for SC-MTCH, see TS 36.213 [23].
onDurationTimerSCPTM	DOOT Search space for 50-mitori, see 15 50.215 [25].
	1 [6]. Value in number of MPDCCH sub-frames. Value psf300 corresponds
	esponds to 400 MPDCCH sub-frames and so on.
schedulingPeriodStartOffsetSCPTM	
	hedulingOffset in TS 36.321 [6]. The value of SCPTM-SchedulingCycle is in
	onds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so on. The
value of SCPTM-SchedulingOffset is in nu	
v	
sc-mtch-CarrierFreq	
Downlink carrier used for multicast SC-MT	CH transmissions.
sc-mtch-neighbourCell	
	de this service on SC-MTCH. The first bit is set to 1 if the service is provided
	hbourCellList, otherwise it is set to 0. The second bit is set to 1 if the service
•	Il in <i>scptmNeighbourCellList</i> , and so on. If this field is absent, the UE shall
assume that this service is not available of	n SC-MTCH in any neighbour cell.
sc-mtch-schedulingInfo	
DRX information for the SC-MTCH. If this	field is absent, DRX is not used for SC-MTCH reception.
р-а	
Parameter: $P''_{i}$ for the SC-MTCH per G-B	NTI, see TS 36.213 [23], clause 5.2. Value dB-6 corresponds to -6 dB, dB-
11	
4dot77 corresponds to -4.77 dB etc.	

# SCPTM-NeighbourCellList

_

The IE *SCPTM-NeighbourCellList* indicates a list of neighbour cells where ongoing MBMS sessions provided via SC-MRB in the current cells are also provided.

-- ASN1START SCPTM-NeighbourCellList-r13 ::= SEQUENCE (SIZE (1..maxNeighCell-SCPTM-r13)) OF PCI-ARFCN-r13 PCI-ARFCN-r13 ::= SEQUENCE { physCellId-r13 PhysCellId, carrierFreq-r13 ARFCN-ValueEUTRA-r9 OPTIONAL } -- ASN1STOP

#### carrierFreg

Indicates the frequency of the neighbour cell indicated by *physCellId*. Absence of the IE means that the neighbour cell is on the same frequency as the current cell.

SCPTM-NeighbourCellList field description

# 6.3.8 Sidelink information elements

## SL-AnchorCarrierFreqList-V2X

The IE *SL-AnchorCarrierFreqList-V2X* specifies the SL V2X anchor frequencies i.e. frequencies that include intercarrier resource configuration for V2X sidelink communication.

### SL-AnchorCarrierFreqList-V2X information element

-- ASN1START

SL-AnchorCarrierFreqList-V2X-r14 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9

-- ASN1STOP

## SL-CBR-CommonTxConfigList

The IE *SL-CBR-CommonTxConfigList* indicates the list of PSSCH transmission parameters (such as MCS, sub-channel number, retransmission number, CR limit) in *sl-CBR-PSSCH-TxConfigList*, and the list of CBR ranges in *cbr-RangeCommonConfigList*, to configure congestion control to the UE for V2X sidelink communication.

## SL-CBR-CommonTxConfigList information element

```
-- ASN1START
SL-CBR-CommonTxConfigList-r14 ::=
                                    SEQUENCE {
    cbr-RangeCommonConfigList-r14
                                    SEQUENCE (SIZE (1..maxSL-V2X-CBRConfig-r14)) OF SL-CBR-Levels-
Config-r14,
   sl-CBR-PSSCH-TxConfigList-r14
                                   SEQUENCE (SIZE (1..maxSL-V2X-TxConfig-r14)) OF SL-CBR-PSSCH-
TxConfig-r14
SL-CBR-Levels-Config-r14 ::=
                                    SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF SL-CBR-r14
                                    SEQUENCE {
SL-CBR-PSSCH-TxConfig-r14 ::=
                                    INTEGER(0..10000),
    cr-Limit-r14
    tx-Parameters-r14
                                    SL-PSSCH-TxParameters-r14
}
SL-CBR-r14 ::=
                                    INTEGER(0..100)
-- ASN1STOP
```

SL-CBR-CommonTxConfigList field descriptions	
cbr-RangeCommonConfigList	
Indicates the list of CBR ranges. Each entry of the list indicates in <i>SL-CBR-Levels-Config</i> the upper bound of the CBR range for the respective entry. The upper bounds of the CBR ranges are configured in ascending order for consecutive entries of <i>cbr-RangeCommonConfigList</i> . For the first entry of <i>cbr-RangeCommonConfigList</i> the lower	
bound of the CBR range is 0. cr-Limit	
Indicates the maximum limit on the occupancy ratio. Value 0 corresponds to 0, value 1 to 0.0001, value 2 to 0.0002,	
and so on (i.e. in steps of 0.0001) until value 10000, which corresponds to 1.	
sI-CBR-PSSCH-TxConfigList	
Indicates the list of available PSSCH transmission parameters (such as MCS, sub-channel number, retransmission	
number and CR limit) configurations.	
SL-CBR	
Value 0 corresponds to 0, value 1 to 0.01, value 2 to 0.02, and so on.	
tx-Parameters	
Indicates PSSCH transmission parameters.	

# SL-CBR-PPPP-TxConfigList

The IE *SL-CBR-PPPP-TxConfigList* indicates the mapping between PSSCH transmission parameter (such as MCS, PRB number, retransmission number, CR limit) sets by using the indexes of the configurations provided in *sl-CBR-PSSCH-TxConfigList*, CBR ranges by an index to the entry of the CBR range configuration in *cbr-RangeCommonConfigList*, and PPPP ranges. It also indicates the default PSSCH transmission parameters to be used when CBR measurement results are not available.

### SL-CBR-PPPP-TxConfigList information element

```
SL-CBR-PPPP-TxConfigList-r14 ::=
                                                 SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxConfigIndex-r14
SL-PPPP-TxConfigIndex-r14 ::=SEQUENCE {priorityThreshold-r14SL-Priority-r13,defaultTxConfigIndex-r14INTEGER(0..maxCBR-Level-1-r14),cbr-ConfigIndex-r14INTEGER(0..maxSL-V2X-CBRConfig-1-r14),tx-ConfigIndexList-r14SEQUENCE (SIZE (1..maxCBR-Level-r14))
                                               SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF Tx-ConfigIndex-r14
Tx-ConfigIndex-r14 ::=
                                                 INTEGER(0..maxSL-V2X-TxConfig-1-r14)
SL-CBR-PPPP-TxConfigList-v1530 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxConfigIndex-v1530
SL-PPPP-TxConfigIndex-v1530 ::=
                                                 SEQUENCE {
     mcs-PSSCH-RangeList-r15
                                                   SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF MCS-PSSCH-Range-r15
                                OPTIONAL
                                                       --Need OR
}
MCS-PSSCH-Range-r15 ::=
                                    SEQUENCE {
     minMCS-PSSCH-r15
                                      INTEGER (0..31),
     maxMCS-PSSCH-r15
                                           INTEGER (0..31)
}
SL-CBR-PPPP-TxConfigList-r15 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxConfigIndex-r15
SL-PPPP-TxConfigIndex-r15 ::= SEQUENCE {

priorityThreshold-r15 SL-Priority-r13,

defaultTxConfigIndex-r15 INTEGER(0..maxCBR-Level-1-r14),

INTEGER(0..maxSL-V2X-CBRConfig-1)

INTEGER(0..maxCBR-Level-1-r14),

INTEGER(0..maxCBR-Level-1-r14),
     cbr-ConfigIndex-r15
tx-ConfigIndexList-r15
mcs-PSSCH-RangeList-r15
                                                 INTEGER(0..maxSL-V2X-CBRConfig-1-r14),
                                               SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF Tx-ConfigIndex-r14,
                                                      SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF MCS-PSSCH-Range-r15
}
```

-- ASN1STOP

-- ASN1START

### SL-CBR-PPPP-TxConfigList field descriptions

## cbr-ConfigIndex

Indicates the CBR ranges to be used by an index to the entry of the CBR range configuration in cbr-

#### RangeCommonConfigList. defaultTxConfigIndex

Indicates the PSSCH transmission parameters to be used by the UEs which do not have available CBR measurement results, by means of an index to the corresponding entry in *tx-ConfigIndexList*. Value 0 indicates the first entry in *tx-ConfigIndexList*. The field is ignored if the UE has available CBR measurement results.

### mcs-PSSCH-RangeList

If included, this field applies to the PPPP(s) indicated by the *priorityThreshold* and each entry in this field sequentially corresponds to each CBR range indicated by *cbr-ConfigIndex*.

#### minMCS-PSSCH, maxMCS-PSSCH

Indicates the minimum and maximum MCS values which correspond to both the MCS table in Table 8.6.1-1 and Table 14.1.1-2 in TS 36.213 [23] used for transmission on PSSCH.

#### priorityThreshold

Indicates the upper bound of PPPP range which is associated with the configurations in *cbr-ConfigIndex* and in *tx-ConfigIndexList*. The upper bounds of the PPPP ranges are configured in ascending order for consecutive entries of *SL-PPPP-TxConfigIndex* in *SL-CBR-PPPP-TxConfigList*. For the first entry of *SL-PPPP-TxConfigIndex*, the lower bound of the PPPP range is 1.

## SL-CBR-PPPP-TxConfigList-v1530

If included, E-UTRAN shall include the same number of entries, and listed in the same order, as in *SL-CBR-PPPP-TxConfigList-r14*.

#### tx-ConfigIndexList

Indicates the list of the PSSCH transmission parameters and CR limit by the indexes to the entries of the configurations in *sl-CBR-PSSCH-TxConfigList*. Each index in *tx-ConfigIndexList* sequentially maps to each CBR range indicated by *cbr-ConfigIndex*.

_

# SL-CommConfig

The IE *SL-CommConfig* specifies the dedicated configuration information for sidelink communication. In particular it concerns the transmission resource configuration for sidelink communication on the primary frequency.

## SL-CommConfig information element



}	
<pre>} } commTxAllowRelayDedicated-r13 ]] }</pre>	OPTIONAL, Need ON BOOLEAN OPTIONAL Need ON
LogicalChGroupInfoList-r13 ::= SEQ	UENCE (SIZE (1maxLCG-r13)) OF SL-PriorityList-r13
SL-CommTxPoolToAddModList-r12 ::= CommTxPoolToAddMod-r12	SEQUENCE (SIZE (1maxSL-TxPool-r12)) OF SL-
SL-CommTxPoolToAddModListExt-r13 ::= CommTxPoolToAddModExt-r13	SEQUENCE (SIZE (1maxSL-TxPool-v1310)) OF SL-
<pre>SL-CommTxPoolToAddMod-r12 ::= SEQ     poolIdentity-r12     pool-r12 }</pre>	UENCE { SL-TxPoolIdentity-r12, SL-CommResourcePool-r12
<pre>SL-CommTxPoolToAddModExt-r13 ::=     poolIdentity-v1310     pool-r13 }</pre>	SEQUENCE { SL-TxPoolIdentity-v1310, SL-CommResourcePool-r12
MAC-MainConfigSL-r12 ::= SEQUENC periodic-BSR-TimerSL retx-BSR-TimerSL }	E { PeriodicBSR-Timer-r12 OPTIONAL, Need ON RetxBSR-Timer-r12

```
-- ASN1STOP
```

#### SL-CommConfig field descriptions

commTxAllowRelayDedicated Indicates whether the UE is allowed to transmit relay related sidelink communication using the configured dedicated transmission resources i.e. either via scheduled or via UE selected resources. commTxPoolNormalDedicated Indicates a pool of transmission resources the UE is allowed to use while in RRC_CONNECTED. logicalChGroupInfoList Indicates for each logical channel group the list of associated priorities, used as specified in TS 36.321 [6], in order of increasing logical channel group identity. mcs Indicates the MCS as defined in TS 36.212 [23], clause 14.2.1. If not configured, the selection of MCS is up to UE implementation. multipleTx Indicates whether the UE should perform multiple transmissions to different destinations in one SC period in accordance with TS 36.321 [6], clause 5.14.1.1. Value TRUE indicates that multiple transmissions should be performed. sc-CommTxConfig Indicates a pool of resources for SC when E-UTRAN schedules Tx resources (i.e. when indices included in DCI format 5 indicate the actual data resources to be used as specified in TS 36.212 [22], clause 5.3.3.1.9). scheduled Indicates the configuration for the case E-UTRAN schedules the transmission resources based on sidelink specific BSR from the UE. ue-Selected Indicates the configuration for the case the UE selects the transmission resources from a pool of resources configured by E-UTRAN.

## SL-CommResourcePool

The IE *SL-CommResourcePool* and *SL-CommResourcePoolV2X* specifies the configuration information for an individual pool of resources for sidelink communication and V2X sidelink communication respectively. The IE covers the configuration of both the sidelink control information and the data.

## SL-CommResourcePool information element

-- ASN1START

```
SL-CommTxPoolList-r12 ::=
                              SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-CommResourcePool-r12
SL-CommTxPoolListExt-r13 ::= SEQUENCE (SIZE (1..maxSL-TxPool-v1310)) OF SL-CommResourcePool-r12
SL-CommTxPoolListV2X-r14 ::=
                                   SEQUENCE (SIZE (1..maxSL-V2X-TxPool-r14)) OF SL-
CommResourcePoolV2X-r14
                              SEQUENCE (SIZE (1..maxSL-RxPool-r12)) OF SL-CommResourcePool-r12
SL-CommRxPoolList-r12 ::=
SL-CommRxPoolListV2X-r14 ::=
                                   SEQUENCE (SIZE (1..maxSL-V2X-RxPool-r14)) OF SL-
CommResourcePoolV2X-r14
SL-CommResourcePool-r12 ::= SEQUENCE {
    sc-CP-Len-r12
                                       SL-CP-Len-r12,
    sc-Period-r12
                                        SL-PeriodComm-r12,
    sc-TF-ResourceConfig-r12
                                        SL-TF-ResourceConfig-r12,
   data-CP-Len-r12SL-HoppingConfig-r12dataHoppingConfig-r12SL-HoppingConfig-r13ue-SelectedResourceConfig-r12SEQUENCE {data-TF-ResourceConfig-r12SL-TF-ResourceConfig-r12,Cubcet-r12SL-TRPT-Subset-r12 OPTIONALOPTIONOPTIONAL
    data-CP-Len-r12
                                       SL-CP-Len-r12,
                                               SL-TF-ResourceConfig-r12,
                                                                           -- Need OP
                                                                    OPTIONAL, -- Need OR
    rxParametersNCell-r12
                                       SEQUENCE {
                                      TDD-Config
       tdd-Config-r12
                                                                    OPTIONAL, -- Need OP
       syncConfigIndex-r12 INTEGER (0..15)
                                                                    OPTIONAL,
                                                                                 -- Need OR
    txParameters-r12
                                       SEQUENCE {
       sc-TxParameters-r12
       dataTxParameters-r12
                                        SL-TxParameters-r12,
                                       SL-TxParameters-r12
    }
                                                                    OPTIONAL, -- Cond Tx
                                     SL-PriorityList-r13
    [[ priorityList-r13
                                                                    OPTIONAL
                                                                                 -- Cond Tx
}
SL-CommResourcePoolV2X-r14 ::=
                                   SEQUENCE {
                                   SL-OffsetIndicator-r12 OPTIONAL, -- Need OR
   sl-OffsetIndicator-r14
    sl-Subframe-r14
                                       SubframeBitmapSL-r14,
    adjacencyPSCCH-PSSCH-r14
                                       BOOLEAN,
    sizeSubchannel-r14
                                        ENUMERATED {
                                       n4, n5, n6, n8, n9, n10, n12, n15, n16, n18, n20, n25, n30,
                                       n48, n50, n72, n75, n96, n100, spare13, spare12, spare11,
                                        spare10, spare9, spare8, spare7, spare6, spare5, spare4,
                                        spare3, spare2, spare1},
   numSubchannel-r14
                                        ENUMERATED {n1, n3, n5, n8, n10, n15, n20, spare1},
                                        INTEGER (0..99),
    startRB-Subchannel-r14
    startRB-PSCCH-Pool-r14
                                       INTEGER (0..99)
                                                                    OPTIONAL, -- Need OR
                                       SEQUENCE {
   rxParametersNCell-r14
                                       TDD-Config
       tdd-Config-r14
                                                                   OPTIONAL, -- Need OP
                                       INTEGER (0..15)
       syncConfigIndex-r14
                                                                    OPTIONAL, -- Need OR
                                                                  OPTIONAL, -- Cond Tx
OPTIONAL, -- Need OR
    dataTxParameters-r14
                                       SL-TxParameters-r12
                                                                  OPTIONAL, -- Need OR
OPTIONAL, -- Need OR
    zoneID-r14
                                        INTEGER (0..7)
                                         INTEGER (0..45)
    threshS-RSSI-CBR-r14
                                       SL-V2X-TxPoolReportIdentity-r14 OPTIONAL, -- Need OR
SL-CBR-PPPP-TxConfigList-r14 OPTIONAL, -- Need OR
    poolReportId-r14
    cbr-pssch-TxConfigList-r14
   resourceSelectionConfigP2X-r14 SL-P2X-ResourceSelectionConfig-r14 OPTIONAL, -- Cond P2X
                                                                                   -- Need OR
                                        SL-SyncAllowed-r14
                                                                        OPTIONAL,
    syncAllowed-r14
    restrictResourceReservationPeriod-r14 SL-RestrictResourceReservationPeriodList-r14
   OPTIONAL, -- Need OR
                                   SL-MinT2ValueList-r15
    [[ sl-MinT2ValueList-r15
                                                               OPTIONAL, -- Need OR
       cbr-pssch-TxConfigList-v1530 SL-CBR-PPPP-TxConfigList-v1530 OPTIONAL -- Need OR
    11
}
SL-TRPT-Subset-r12 ::=
                               BIT STRING (SIZE (3..5))
SL-V2X-TxPoolReportIdentity-r14::= INTEGER (1..maxSL-PoolToMeasure-r14)
SL-MinT2ValueList-r15 ::= SEQUENCE (SIZE (1..maxSL-Prio-r13)) OF SL-MinT2Value-r15
SL-MinT2Value-r15 ::=
                                SEQUENCE {
   priorityList-r15
                                       SL-PriorityList-r13,
   minT2Value-r15
                                       INTEGER (10..20)
}
```

-- ASN1STOP

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#### SL-CommResourcePool field descriptions

### adjacencyPSCCH-PSSCH

Indicates whether a UE shall always transmit PSCCH and PSSCH in adjacent RBs (indicated by TRUE) or in nonadjacent RBs (indicated by FALSE) (see TS 36.213 [23]).

#### trpt-Subset

Indicates the subset of T-RPT available (see TS 36.213 [23], clause 14.1.1.1). Consists of a bitmap which is used to indicate the set of available 'k' values to be used for sidelink communication (see TS 36.213 [23], clause 14.1.1.3). If T-RPT subset configuration is not signaled/ preconfigured then UE assumes the whole T-RPT set is available.

## zonelD

Indicates the zone ID for which the UE shall use this resource pool as described in 5.10.13.2. The field is absent in v2x-CommTxPoolExceptional, p2x-CommTxPoolNormalCommon, p2x- CommTxPoolNormal and v2x-CommRxPool in SIB21, in SIB26 or in mobilityControlInfoV2X.

Conditional presence	Explanation
Tx	The field is mandatory present when included in <i>commTxPoolNormalDedicated</i> , <i>commTxPoolNormalDedicatedExt</i> , <i>commTxPoolNormalCommon</i> , <i>commTxPoolNormalCommonExt</i> , <i>commTxPoolExceptional</i> , <i>sc-CommTxConfig</i> , <i>v2x-</i> <i>CommTxPoolNormalCommon</i> , <i>v2x-CommTxPoolExceptional</i> , <i>v2x-</i> <i>CommTxPoolNormalDedicated</i> , <i>p2x-CommTxPoolNormalCommon</i> or <i>v2x-</i> <i>CommTxPoolNormal</i> and <i>p2x-CommTxPoolNormal</i> in <i>v2x-InterFreqInfoList</i> . Otherwise
P2X	the field is not present.         The field is mandatory present when included in p2x-CommTxPoolNormalCommon, v2x- CommTxPoolNormalDedicated in sl-V2X-ConfigDedicated for P2X related V2X sidelink communication or p2x-CommTxPoolNormal in v2x-InterFreqInfoList. Otherwise the field is not present.

## SL-CommTxPoolSensingConfig

The IE *SL-CommTxPoolSensingConfig* specifies V2X sidelink communication configurations used for UE autonomous resource selection.

### SL-CommTxPoolSensingConfig information element

```
SL-CommTxPoolSensingConfig-r14 ::=
                                       SEQUENCE {
   pssch-TxConfigList-r14
                                          SL-PSSCH-TxConfigList-r14,
                                           SL-ThresPSSCH-RSRP-List-r14,
    thresPSSCH-RSRP-List-r14
    restrictResourceReservationPeriod-r14 SL-RestrictResourceReservationPeriodList-r14
    OPTIONAL,
               -- Need OR
   probResourceKeep-r14
                                      ENUMERATED {v0, v0dot2, v0dot4, v0dot6, v0dot8,
                                                   spare3,spare2, spare1},
                                           SEQUENCE {
    p2x-SensingConfig-r14
       minNumCandidateSF-r14
                                           INTEGER (1..13),
       gapCandidateSensing-r14
                                           BIT STRING (SIZE (10))
          OPTIONAL, -- Need OR
    sl-ReselectAfter-r14
                                       ENUMERATED {n1, n2, n3, n4, n5, n6, n7, n8, n9,
                                               spare7, spare6, spare5, spare4, spare3, spare2,
                                               spare1}
                                                                  OPTIONAL
                                                                                  -- Need OR
}
```

-- ASN1STOP

-- ASN1START

### SL-CommTxPoolSensingConfig field descriptions gapCandidateSensing Indicates which subframe should be sensed when a certain subframe is considered as a candidate resource (see TS 36.213 [23]) minNumCandidateSF Indicates the minimum number of subframes that are included in the possible candidate resources. p2x-SensingConfig Indicates the sensing configuration for P2X related V2X sidelink communication transmission only. probResourceKeep Indicates the probability with which the UE keeps the current resource when the resource reselection counter reaches zero for sensing based UE autonomous resource selection (see TS 36.321 [6]). pssch-TxConfigList Indicates PSSCH TX parameters such as MCS, PRB number, retransmission number, associated to different UE absolute speeds and different synchronization reference types for UE autonomous resource selection (see TS 36.213 [23]). restrictResourceReservationPeriod Indicates which values are allowed for the signaling of the resource reservation period in PSCCH. sl-ReselectAfter Indicates the number of consecutive skipped transmissions before triggering resource reselection for V2X sidelink communication (see TS 36.321 [6]).

#### thresPSSCH-RSRP-List

Indicates a list of 64 thresholds, and the threshold should be selected based on the priority in the decoded SCI and the priority in the SCI to be transmitted (see TS 36.213 [23]). A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above a threshold.

SL-CP-Len

The IE SL-CP-Len indicates the cyclic prefix length, see TS 36.211 [21].

## SL-CP-Len information element

-- ASN1START

SL-CP-Len-r12 ::=

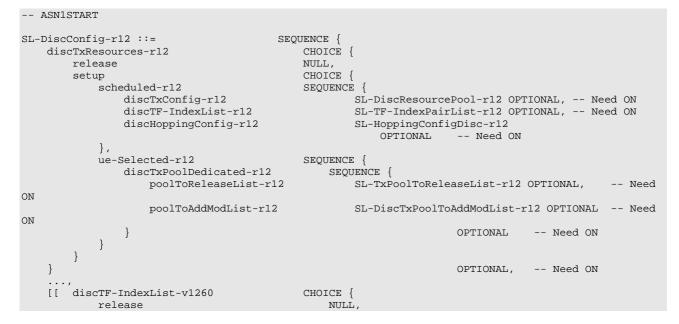
ENUMERATED {normal, extended}

-- ASN1STOP

## - SL-DiscConfig

The IE SL-DiscConfig specifies the dedicated configuration information for sidelink discovery.

## SL-DiscConfig information element



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SEQUENCE { setup SL-TF-IndexPairList-r12b discTF-IndexList-r12b } } OPTIONAL -- Need ON 11. [[ discTxResourcesPS-r13 CHOICE { NULL, release CHOICE { setup scheduled-r13 SL-DiscTxConfigScheduled-r13, ue-Selected-r13 SEQUENCE { discTxPoolPS-Dedicated-r13 SL-DiscTxPoolDedicated-r13 } OPTIONAL, -- Need ON discTxInterFreqInfo-r13 CHOICE { NULL, release SEOUENCE { setup ARFCN-ValueEUTRA-r9 OPTIONAL, -- Need discTxCarrierFreq-r13 OR discTxRefCarrierDedicated-r13 SL-DiscTxRefCarrierDedicated-r13 OPTIONAL, --Need OR discTxInfoInterFreqListAdd-r13 SL-DiscTxInfoInterFreqListAdd-r13 OPTIONAL -- Need ON } } OPTIONAL, -- Need ON gapRequestsAllowedDedicated-r13 BOOLEAN OPTIONAL, -- Need ON discRxGapConfig-r13 CHOICE { release NULL, SL-GapConfig-r13 setup OPTIONAL. -- Need ON discTxGapConfig-r13 CHOICE { release NULL, SL-GapConfig-r13 setup OPTIONAL. -- Need ON CHOICE { discSysInfoToReportConfig-r13 release NULL, setup SL-DiscSysInfoToReportFreqList-r13 OPTIONAL -- Need ON } 11 } SL-DiscSysInfoToReportFreqList-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF ARFCN-ValueEUTRA-r9 SL-DiscTxInfoInterFreqListAdd-r13 ::= SEQUENCE { discTxFreqToAddModList-r13 SEQUENCE (SIZE (1..maxFreq)) OF SL-DiscTxResourceInfoPerFreq-r13 OPTIONAL, -- Need ON -- Need ON SEQUENCE (SIZE (1..maxFreq)) OF ARFCN-ValueEUTRA-r9 discTxFreqToReleaseList-r13 OPTIONAL, -- Need ON . . . } SL-DiscTxResourceInfoPerFreq-r13 ::= SEQUENCE { discTxCarrierFreq-r13 ARFCN-ValueEUTRA-r9, SL-DiscTxResource-r13 OPTIONAL, -- Need OR SL-DiscTxResource-r13 OPTIONAL, -- Need OR discTxResources-r13 discTxResourcesPS-r13 discTxRefCarrierDedicated-r13 SL-DiscTxRefCarrierDedicated-r13 OPTIONAL, -- Need OR discCellSelectionInfo-r13 CellSelectionInfoNFreq-r13 OPTIONAL, Need OR . . . } SL-DiscTxResource-r13 ::= CHOICE { NULL. release setup CHOICE { scheduled-r13 SL-DiscTxConfigScheduled-r13, ue-Selected-r13 SL-DiscTxPoolDedicated-r13 } } SL-DiscTxPoolToAddModList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-DiscTxPoolToAddMod-r12 SL-DiscTxPoolToAddMod-r12 ::= SEOUENCE poolIdentity-r12 SL-TxPoolIdentity-r12, pool-r12 SL-DiscResourcePool-r12 }

```
      SL-DiscTxConfigScheduled-r13 ::=
      SEQUENCE {

      discTxConfig-r13
      SL-DiscResourcePool-r12 OPTIONAL, -- Need ON

      NineTTE_IndexList_r13
      SL-TF-IndexPairList-r12b
      OPTIONAL, -- Need ON

}
SL-DiscTxPoolDedicated-r13 ::= SEQUENCE {
poolToReleaseList-r13 SL-TxPoolToReleaseList-r12 OPTIONAL,
poolToAddModList-r13 SL-DiscTxPoolToAddModList-r12 OPTIONAL
                                                                                               -- Need ON
     poolToAddModList-r13
                                             SL-DiscTxPoolToAddModList-r12 OPTIONAL -- Need ON
}
SL-TF-IndexPairList-r12 ::= SEQUENCE (SIZE (1..maxSL-TF-IndexPair-r12)) OF SL-TF-IndexPair-r12
SL-TF-IndexPair-r12 ::=
                                 SEQUENCE
                                                  {
INTEGER (1.. 200)
                                                                               OPTIONAL, -- Need ON
    discSF-Index-r12
     discPRB-Index-r12
                                                  INTEGER (1.. 50)
                                                                               OPTTONAL
                                                                                            -- Need ON
}
SL-TF-IndexPairList-r12b ::=
                                            SEQUENCE (SIZE (1..maxSL-TF-IndexPair-r12)) OF SL-TF-IndexPair-
r12b
SL-TF-IndexPair-r12b ::= SEQUENCE
                                                       {
     discSF-Index-r12b
                                                 INTEGER (0..209) OPTIONAL,
                                                                                               -- Need ON
     discPRB-Index-r12b
                                                                                OPTIONAL
                                                  INTEGER (0..49)
                                                                                               -- Need ON
}
SL-DiscTxRefCarrierDedicated-r13 ::=
                                                  CHOICE {
    pCell
                                                  NULL.
                                                  SCellIndex-r10
     sCell
}
-- ASN1STOP
```

#### SL-DiscConfig field descriptions

#### discCellSelectionInfo

Parameters that may be used by the UE to select/ reselect a cell on the concerned non serving frequency. If absent, the UE acquires the information from the target cell on the concerned frequency. See TS 36.304 [4], clause 11.4. discSysInfoToReportConfig Indicates the request to start a SidelinkUEInformation procedure for reporting system information acquired during an inter-frequency discovery procedure. discTF-IndexList Indicates a list of time-frequency resource indices pair where each pair of indices corresponds to one discovery message. E-UTRAN only configures discTF-IndexList-r12b when configuring the UE with scheduled SL discovery Tx resources. When receiving discTF-IndexList-r12b, the UE shall only consider this field (and hence ignore discTF-IndexList-r12, if included or previously configured). discTxConfig Indicates the resources configuration used when E-UTRAN schedules Tx resources (i.e. the fields discSF-Index and discPRB-Index indicate the actual resources to be used). discTxInterFreaInfo Indicates frequency applicable for the resources indicated by discTxResources-r12 (i.e. original resource field may cover first inter-frequency), and possibly resource allocations on additional frequencies as may be indicated by field

### discTxInfoInterFreqListAdd.

#### discTxRefCarrierDedicated

Indicates if the PCell or an SCell is to be used as reference for DL measurements and synchronization, instead of the DL frequency paired with the one used to transmit sidelink discovery announcements on, see TS 36.213 [23], clause 14.3.1.

#### discTxResources

Indicates the resources assigned to the UE for discovery announcements, which can either be a pool from which the UE may select or a set of resources specifically assigned for use by the UE.

### discTxResourcesPS

Indicates the resources assigned to the UE for PS discovery announcements, which can either be a pool from which the UE may select or a set of resources specifically assigned for use by the UE.

### SL-TF-IndexPair

A pair of indices, one for the time domain and one for the frequency domain, indicating the start of resources within the pool covered by *discTxConfig*, see TS 36.211 [21], clause 9.5.6 for one discovery message. The upper limits of *discSF-Index* and *discPRB-Index* are defined in TS 36.213 [23], clause 14.3.1.

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## SL-DiscResourcePool

The IE *SL-DiscResourcePool* specifies the configuration information for an individual pool of resources for sidelink discovery.

#### SL-DiscResourcePool information element

```
SL-DiscTxPoolList-r12 ::=
                              SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-DiscResourcePool-r12
SL-DiscRxPoolList-r12 ::=
                               SEQUENCE (SIZE (1..maxSL-RxPool-r12)) OF SL-DiscResourcePool-r12
SL-DiscResourcePool-r12 ::=
                               SEQUENCE
                                           {
                                  SL-CP-Len-r12,
    cp-Len-r12
                               ENUMERATED {rf32, rf64, rf128,
    discPeriod-r12
                                           rf256, rf512, rf1024, rf16-v1310, spare},
   numRetx-r12INTEGER (0...s),numRepetition-r12INTEGER (1..50),tf-ResourceConfig-r12SL-TF-ResourceConfig-r12,SEQUENCE {
       rameters-r12 SEQUENCE {
txParametersGeneral-r12 SL-TxParameters-r12,
       ue-SelectedResourceConfig-r12 SEQUENCE {
                                         CHOICE {
           poolSelection-r12
               rsrpBased-r12
                                               SL-PoolSelectionConfig-r12,
               random-r12
                                               NULL
           },
           txProbability-r12
                                     ENUMERATED {p25, p50, p75, p100}
       }
                                                                   OPTIONAL
                                                                               -- Need OR
                                                                   OPTIONAL,
                                                                               -- Cond Tx
       tdd-Config-r12
    rxParameters-r12
                                   SEQUENCE {
                                      TDD-Config
                                                                   OPTIONAL.
                                                                               -- Need OR
                                  INTEGER (0..15)
        syncConfigIndex-r12
    }
                                                                   OPTIONAL,
                                                                               -- Need OR
    [[ discPeriod-v1310
                                       CHOICE {
                                               NULL,
           release
                                               ENUMERATED {rf4, rf6, rf7, rf8,
           setup
                                                  rf12, rf14, rf24, rf28}
                                                                   OPTIONAL,
                                                                               -- Need ON
           }
       rxParamsAddNeighFreq-r13
                                       CHOICE {
           release
                                           NULT.
                                           SEQUENCE {
           setup
               physCellId-r13
                                               PhysCellIdList-r13
           }
                                                                   OPTIONAL, -- Need ON
        txParamsAddNeighFreq-r13
                                     CHOICE {
           release
                                           NULL,
                                           SEQUENCE {
           setup
               physCellId-r13
                                               PhysCellIdList-r13,
               p-Max
                                               P-Max
                                                                      OPTIONAL,
                                                                                  -- Need OP
                tdd-Config-r13
                                               TDD-Config
                                                                      OPTIONAL, -- Cond TDD-OR
                                               TDD-Config-v1130
                tdd-Config-v1130
                                                                      OPTIONAL,
                                                                                   -- Cond TDD-OR
                                                 SEQUENCE {
               freqInfo
                                                       ARFCN-ValueEUTRA OPTIONAL,
                   ul-CarrierFreq
                                                                                      -- Need OP
                   ul-Bandwidth
                                                       ENUMERATED {n6, n15, n25, n50, n75, n100}
                                                                           OPTIONAL, -- Need OP
               additionalSpectrumEmission
                                                  AdditionalSpectrumEmission
                },
                                                   INTEGER (-60..50),
                referenceSignalPower
                syncConfigIndex-r13
                                               INTEGER (0..15)
                                                                      OPTIONAL -- Need OR
           }
       }
                                                                   OPTIONAL -- Need ON
    11,
    [[ txParamsAddNeighFreq-v1370
                                       CHOICE {
           release
                                           NULL,
                                           SEQUENCE {
           setup
                                               SEQUENCE {
               freqInfo-v1370
                   additionalSpectrumEmission-v1370
                                                           AdditionalSpectrumEmission-v1010
                }
           }
        }
                                                                   OPTIONAL -- Need ON
    11
}
PhysCellIdList-r13 ::=
                          SEQUENCE (SIZE (1.. maxSL-DiscCells-r13)) OF PhysCellId
```

SL-PoolSelectionConfig-r12 :	:= SEQU	JENCE {
threshLow-r12		RSRP-RangeSL2-r12,
threshHigh-r12		RSRP-RangeSL2-r12
1		

-- ASN1STOP

-- ASN1START

#### SL-DiscResourcePool field descriptions

### discPeriod Indicates the period over which resources are allocated in a cell for discovery message transmission/reception, see PSDCH period in TS 36.213 [23]. Value in number of radio frames. Value rf32 corresponds to 32 radio frames, rf64 corresponds to 64 radio frames and so on. The extended values apply for PS discovery (not only for sidelink relaying). When broadcasting an extended value, E-UTRAN sets the original field to spare to ensure legacy UEs ignore the concerned pool entry. numRepetition Indicates the number of times subframeBitmap is repeated for mapping to subframes that occurs within a discPeriod. The highest value E-UTRAN uses is value 5 for FDD and TDD configuration 0, value 13 for TDD configuration 1, value 25 for TDD configuration 2, value 17 for TDD configuration 3, value 25 for TDD configuration 4, value 50 for TDD configuration 5 and value 7 for TDD configuration 6. E-UTRAN configures numRepetition and subframeBitmap such that the mapped subframes do not exceed the discPeriod. poolSelection Indicates the mechanism for selecting a (transmission) pool when multiple candidates are provided. E-UTRAN configures the same value (i.e. a pool selection method) for all candidate pools within one pool list (discTxPoolCommon or discTxPoolDedicated) but the pool selection method in different pool lists may or may not be the same. syncConfigIndex Indicates the synchronisation configuration that is associated with a reception or transmission pool, by means of an index to the corresponding entry of discSyncConfig in SystemInformationBlockType19. threshLow, threshHigh Specifies the thresholds used to select a resource pool in RSRP based pool selection. The E-UTRAN should configure threshLow and threshHigh such that the UE selects only one resource pool upon RSRP based pool selection. txProbabilitv Indicates the probability of transmitting announcement in a discovery period when configured with a pool of resources, see TS 36.321 [6].

Conditional presence	Explanation
TDD-OR	The field is optional present for TDD, need OR; it is not present for FDD.
Tx	The field is mandatory present when included in <i>discTxPoolDedicated</i> or
	discTxPoolCommon. Otherwise the field is not present.

## SL-DiscSysInfoReport

The IE *SL-DiscSysInfoReport* contains the parameters related to sidelink discovery acquired from system information of inter-frequency cells (including inter-PLMN).

### SL-DiscSysInfoReport information element

ADIVIDIAN		
SL-DiscSysInfoReport-r13 ::=	SEQUENCE {	
plmn-IdentityList-r13	PLMN-IdentityList	OPTIONAL,
cellIdentity-13	CellIdentity	OPTIONAL,
carrierFreqInfo-13	ARFCN-ValueEUTRA-r9	OPTIONAL,
discRxResources-r13	SL-DiscRxPoolList-r12	OPTIONAL,
discTxPoolCommon-r13	SL-DiscTxPoolList-r12	OPTIONAL,
discTxPowerInfo-r13	SL-DiscTxPowerInfoList-r12	OPTIONAL,
discSyncConfig-r13	SL-SyncConfigNFreq-r13	OPTIONAL,
discCellSelectionInfo-r13	SEQUENCE {	
q-RxLevMin-r13	Q-RxLevMin,	
q-RxLevMinOffset-r13	INTEGER (18)	OPTIONAL
}		OPTIONAL,
cellReselectionInfo-r13	SEQUENCE {	
q-Hyst-r13	ENUMERATED {	
	dB0, dB1, dB2,	dB3, dB4, dB5, dB6, dB8, dB10,
	dB12, dB14, dB1	6, dB18, dB20, dB22, dB24},
q-RxLevMin-r13	Q-RxLevMin,	

```
t-ReselectionEUTRA-r13
                                     T-Reselection
                                                            OPTIONAL,
   tdd-Config-r13
                               TDD-Config
                                                            OPTIONAL,
   freqInfo-r13
                                SEQUENCE {
       ul-CarrierFreq-r13
                                     ARFCN-ValueEUTRA
                                                                   OPTIONAL
       ul-Bandwidth-r13
                                     ENUMERATED {n6, n15, n25, n50, n75, n100}
       additionalSpectrumEmission-r13 AdditionalSpectrumEmission OPTIONAL
   }
                                                               OPTIONAL,
   p-Max-r13
                                 P-Max OPTIONAL,
                                INTEGER (-60..50)
   referenceSignalPower-r13
                                                   OPTIONAL,
   11
   freqInfo-v1370
                                SEQUENCE {
       additionalSpectrumEmission-v1370 AdditionalSpectrumEmission-v1010
                                                               OPTIONAL
   11
}
-- ASN1STOP
```

## SL-DiscSysInfoReport field descriptions

 carrierFreqInfo

 Indicates the frequency of the cell from which the UE acquired the system information relevant for discovery

 cellIdentity

 Indicated the identity of the cell from which the UE acquired the system information relevant for discovery

 pImn-IdentityList

 Indicates the list of PLMN identity of the cell from which the UE acquired the system information relevant for discovery

## - SL-DiscTxPowerInfo

The IE SL-DiscTxPowerInfo specifies power control parameters for one or more power classes.

## SL-DiscTxPowerInfo information element

```
-- ASN1START

SL-DiscTxPowerInfoList-r12 ::= SEQUENCE (SIZE (maxSL-DiscPowerClass-r12)) OF SL-DiscTxPowerInfo-r12

SL-DiscTxPowerInfo-r12 ::= SEQUENCE {

discMaxTxPower-r12 P-Max,

...

}
```

-- ASN1STOP

discMaxTxPower

## SL-DiscTxPowerInfo field descriptions

Indicates the P-Max parameter used to calculate the maximum transmit power a UE configured with the concerned range class, see TS 24.333 [70], clause 4.2.11. The first entry in *SL-DiscTxPowerInfoList* corresponds to UE range class 'short', the second entry corresponds to 'medium' and the third entry corresponds to 'long'.

## SL-GapConfig

The IE *SL-GapConfig* indicates the gaps, requested or assigned, to enable the UE to receive or transmit sidelink discovery, intra or inter frequency (includings inter-PLMN).

## SL-GapConfig information element

```
-- ASN1START

SL-GapConfig-r13 ::= SEQUENCE {

gapPatternList-r13 SL-GapPatternList-r13

}

SL-GapPatternList-r13 ::= SEQUENCE (SIZE (1..maxSL-GP-r13)) OF SL-GapPattern-r13
```

```
SL-GapPattern-r13 ::= SEQUENCE {
    gapPeriod-r13 SEQUENCE {
        SEQUENCE {
            ENUMERATED {sf40, sf60, sf70, sf80, sf120, sf140, sf160,
                sf240, sf280, sf320, sf640, sf1280, sf2560, sf5120,
                sf10240},
            gapSubframeBitmap-r13 SL-OffsetIndicator-r12,
        BIT STRING (SIZE (1..10240)),
        ...
}
```

-- ASN1STOP

### SL-GapConfig field descriptions

## gapOffset

-- ASN1START

Indicates the offset from the start of SFN 0 to the start of the first *gapPeriod*. If the SFN period is not an integer multiple of *gapPeriod*, no subframes within this period (i.e. from SFN 0 to offset) are considered part of the gap. *gapPeriod* 

Indicates the period by which gapSubframeBitmap is repeated.

gapSubframeBitmap

Indicates the subframes of one or more individual gaps, not only covering the subframes of the associated discovery resources but also including e.g. re-tuning and synchronisation delays. The UE and E-UTRAN signal bit strings of valid sizes only i.e. sizes equal to or less than *gapPeriod*. Value 1 indicates that the UE is allowed to use the subframe for sidelink discovery.

## SL-GapRequest

The IE *SL-GapRequest* indicates the gaps requested by the UE to receive or transmit sidelink discovery, intra or inter frequency (includings inter-PLMN).

### SL-GapRequest information element

```
SL-GapRequest-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF SL-GapFreqInfo-r13
SL-GapFreqInfo-r13 ::= SEQUENCE {
carrierFreq-r13 ARFCN-ValueEUTRA-r9 OPTIONAL,
gapPatternList-r13 SL-GapPatternList-r13
}
-- ASN1STOP
```

## SL-HoppingConfig

The IE SL-HoppingConfig indicates the hopping configuration used for sidelink.

## SL-HoppingConfig information element

```
-- ASN1START
SL-HoppingConfigComm-r12 ::=
                                       SEQUENCE
    hoppingParameter-r12
                                           INTEGER (0..504),
    numSubbands-r12
                                           ENUMERATED {ns1, ns2, ns4},
    rb-Offset-r12
                                           INTEGER (0..110)
}
SL-HoppingConfigDisc-r12 ::=
                                   SEQUENCE
   a-r12
                                                INTEGER (1..200),
                                                INTEGER (1..10),
ENUMERATED {n1, n5}
    b-r12
    c-r12
}
-- ASN1STOP
```

SL-HoppingConfig field descriptions		
a		
Per cell parameter: $N_{PSDCH}^{(1)}$ see TS 36.213 [23], clause 14.3.1.		
b		
Per UE parameter: $N_{PSDCH}^{(2)}$ see TS 36.213 [23], clause 14.3.1.		
Per UE parameter: ^{1 Y PSDCH} see TS 36.213 [23], clause 14.3.1.		
c		
$N^{(3)}$		
Per cell parameter: $N_{PSDCH}^{(3)}$ see TS 36.213 [23], clause 14.3.1.		
hoppingParameter		
Affects the hopping performed as specificed in TS 36.213 [23], clauses 14.1.1.2 and 14.1.1.4. In case value 504 is		
received, the value used by the UE is 510.		
numSubbands		
Parameter: N _{sb} see TS 36.211 [21], clause 9.3.6.		
rb-Offset		
Parameter: $N_{\rm RB}^{\rm HO}$ , see TS 36.211 [21], clause 9.3.6.		

## SL-InterFreqInfoListV2X

The IE *SL-InterFreqInfoListV2X* indicates synchronization and resource allocation configurations of the neighboring frequency for V2X sidelink communication.

## *SL-InterFreqInfoListV2X* information element

```
-- ASN1START
SL-InterFreqInfoListV2X-r14 ::= SEQUENCE (SIZE (0..maxFreqV2X-1-r14)) OF SL-InterFreqInfoV2X-r14
SL-InterFreqInfoV2X-r14 ::= SEQUENCE {

plmn-IdentityList-r14 PLMN-IdentityList

v2x-CommCarrierFreq-r14 ARFCN-ValueEUTRA-r9,

sl-MaxTxPower-r14 P-Max

sl-Bandwidther14 FNIMFPATED {r6 r1
                                                                         OPTIONAL,
                                                                                           -- Need OP
                                     P-Max OPTIONAL, -- Need OR
ENUMERATED {n6, n15, n25, n50, n75, n100} OPTIONAL,
                                                                             -- Need OR
    sl-Bandwidth-r14
                                                                                                        ___
Need OR
                                                                                      OPTIONAL, -- Need
    v2x-SchedulingPool-r14
                                          SL-CommResourcePoolV2X-r14
OR
    v2x-UE-ConfigList-r14 SL-V2X-UE-ConfigList-r14
                                                              OPTIONAL, -- Need OR
    AdditionalSpectrumEmission-v1010
        }
                                          -- Need ON
                         OPTIONAL
    ]],
        v2x-FreqSelectionConfigList-r15 SL-V2X-FreqSelectionConfigList-r15 OPTIONAL
                                                                                               --Need OR
    [[
    11
}
-- ASN1STOP
```

### SL-InterFreqInfoListV2X field descriptions

## plmn-IdentityList

Indicates PLMN identities of this frequency for reception of V2X sidelink communication. If this field is not present, the UE considers this frequency for reception of V2X sidelink communication concerns the first PLMN entry in the plmn-IdentityList in SystemInformationBlockType1.

### sl-MaxTxPower

Indicates the maximum transmission power for transmitting V2X sidelink communication on the corresponding frequency.

## additionalSpectrumEmissionV2X

Indicates the additionalSpectrumEmission value defined in TS 36.101 [42], clause 6.2.4, for V2X sidelink communication.

### v2x-FreqSelectionConfigList

Indicates the configuration information for the carrier selection for V2X sidelink communication transmission. The configuration applies to the carrier frequency identified by v2x-CommCarrierFreq (i.e. carrier specific configuration).

### v2x-SchedulingPool

Indicates the resource pool for inter-carrier scheduled resource allocation. This field is configured in RRC dedicated signalling only when scheduled is configured in IE SL-V2X-ConfigDedicated.

#### v2x-UE-ConfigList

Indicates the inter-carrier resource configuration. If there is only one entry in the list without physCellId configured, the configuration is applied to the frequency identified by v2x-CommCarrierFreq (i.e. carrier specific configuration); if the entry of this field includes physCellIdList, the configuration is applied to the cell(s) identified by physCellIdList (i.e. cell specific configuration)

# SL-V2X-UE-ConfigList

The IE SL-V2X-UE-ConfigList indicates inter-frequency resource configuration per-carrier or per-cell.

## SL-V2X-UE-ConfigList information element

-- ASN1START SL-V2X-UE-ConfigList-r14 ::= SEQUENCE (SIZE (1.. maxCellIntra)) OF SL-V2X-InterFreqUE-Config-r14 SL-V2X-InterFreqUE-Config-r14 ::= SEQUENCE { physCellIdList-r14 PhysCellIdList-r13 OPTIONAL, -- Need OR OPTIONAL, -- Need OR OPTIONAL, -- Need OR typeTxSync-r14 SL-TypeTxSync-r14 v2x-SyncConfig-r14 SL-SyncConfigListNFreqV2X-r14 OPTIONAL, -- Need SL-CommRxPoolListV2X-r14 v2x-CommRxPool-r14 OR v2x-CommTxPoolNormal-r14 SL-CommTxPoolListV2X-r14 OPTIONAL, Need OR p2x-CommTxPoolNormal-r14 SL-CommTxPoolListV2X-r14 OPTIONAL, ___ Need OR v2x-CommTxPoolExceptional-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need OR -- Need OR v2x-ResourceSelectionConfig-r14 SL-CommTxPoolSensingConfig-r14 OPTIONAL, SL-ZoneConfig-r14 OPTIONAL, -- Need OR zoneConfig-r14 -- Need OR INTEGER (0..1000) offsetDFN-r14 OPTIONAL, . . . }

-- ASN1STOP

SL-V2X-UE-ConfigList field descriptions
offsetDFN
Indicates the timing offset for the UE to determine DFN timing when GNSS is used for timing reference. Value 0
corresponds to 0 milliseconds, value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds,
and so on.
p2x-CommTxPoolNormal
Indicates the resources on a carrier frequency by which the UE may transmit P2X related V2X sidelink
communication.
physCellIdList
If configured, the resource configuration is applicable for the cell(s) identified by this field. Otherwise, the resource
configuration is for a given carrier frequency.
typeTxSync
Indicates the prioritized synchronization type (i.e. eNB or GNSS) for performing V2X sidelink communication on a
carrier frequency.
v2x-CommRxPool
Indicates the resources on a carrier frequency by which the UE may receive V2X sidelink communication. This field is absent within v2x-InterFreqInfoList included in RRCConnectionReconfiguration except if received with
MobilityControlInfo or MobilityControlInfoV2X.
v2x-CommTxPoolExceptional
Indicates the resources on a carrier frequency by which the UE may transmit V2X sidelink communication in
exceptional conditions, as specified in 5.10.13.
v2x-CommTxPoolNormal
Indicates the resources on a carrier frequency by which the UE may transmit V2X sidelink communication.
v2x-SyncConfig
Indicates the synchronization configuration used for transmission/reception of SLSS on the given frequency.

# SL-OffsetIndicator

The IE *SL-OffsetIndicator* indicates the offset of the pool of resources relative to SFN 0 of the cell from which it was obtained or, when out of coverage, relative to DFN 0.

## SL-OffsetIndicator information element

```
-- ASN1START

SL-OffsetIndicator-r12 ::= CHOICE {

small-r12 INTEGER (0..319),

large-r12 INTEGER (0..10239)

}

SL-OffsetIndicatorSync-r12 ::= INTEGER (0..39)

SL-OffsetIndicatorSync-v1430 ::= INTEGER (40..159)

SL-OffsetIndicatorSync-r14 ::= INTEGER (0..159)
```

```
-- ASN1STOP
```

#### SL-OffsetIndicator field descriptions

#### SL-OffsetIndicator

In sc-TF-ResourceConfig, it indicates the offset of the first period of pool of resources within a SFN cycle. For data-TF-ResourceConfig, it corresponds to the offsetIndicator as defined in TS 36.213 [23], clause 14.1.3. SL-OffsetIndicatorSync

SL-OnsetinaicatorSync

For sidelink discovery and sidelink communication, synchronisation resources are present in those SFN and subframes which satisfy the relation: (SFN*10+ *Subframe Number*) mod 40 = SL-OffsetIndicatorSync. For V2X sidelink communication, synchronisation resources are present in those SFN and subframes which satisfy the relation: (SFN*10+ Subframe Number) mod 160 = SL-OffsetIndicatorSync.

## SL-P2X-ResourceSelectionConfig

The IE *SL-P2X-ResourceSelectionConfig* includes the configuration of resource selection for P2X related V2X sidelink communication. E-UTRAN configures at least one resource selection mechanism.

### SL-P2X-ResourceSelectionConfig information element

ASN1START				
<pre>SL-P2X-ResourceSelectionConfig-r14     partialSensing-r14     randomSelection-r14 }</pre>	::= ENUMERATED ENUMERATED	SEQUENCE { {true} {true}	OPTIONAL, OPTIONAL	Need OR Need OR

-- ASN1STOP

SL-P2X-ResourceSelectionConfig field descriptions	
partialSensing	
Indicates that partial sensing is allowed for UE autonomous resource selection in a resource pool.	
randomSelection	
Indicates that random selection is allowed for UE autonomous resource selection in a resource pool.	

## SL-PeriodComm

The IE SL-PeriodComm indicates the period over which resources allocated in a cell for sidelink communication.

## SL-PeriodComm information element

ASN1START	
SL-PeriodComm-r12 ::=	ENUMERATED {sf40, sf60, sf70, sf80, sf120, sf140, sf160, sf240, sf280, sf320, spare6, spare5, spare4, spare3, spare2, spare}

-- ASN1STOP

## SL-Priority

The IE *SL-Priority* indicates the one or more priorities of resource pool used for sidelink communication, or of a logical channel group used in case of scheduled sidelink communication resources, see TS 36.321 [6].

## SL-Priority information element

ASN1START	
SL-PriorityList-r13 ::=	SEQUENCE (SIZE (1maxSL-Prio-r13)) OF SL-Priority-r13
SL-Priority-r13 ::=	INTEGER (18)
ASN1STOP	

## SL-PSSCH-TxConfigList

The IE *SL-PSSCH-TxConfigList* indicates PSSCH transmission parameters. When lower layers select parameters from the range indicated in IE *SL-PSSCH-TxConfigList*, the UE considers both configurations in IE *SL-PSSCH-TxConfigList* and the CBR-dependent configurations represented in IE *SL-CBR-PPPP-TxConfigList*. Only one IE *SL-PSSCH-TxConfig* is provided per *typeTxSync*.

## SL-PSSCH-TxConfigList information element

ASN1START	
SL-PSSCH-TxConfigList-r14 ::=	SEQUENCE (SIZE (1maxPSSCH-TxConfig-r14)) OF SL-PSSCH-TxConfig-r14

```
SL-PSSCH-TxConfig-r14 ::= SEQUENCE {
    typeTxSync-r14
                                    SL-TypeTxSync-r14
                                                               OPTIONAL,
                                                                              -- Need OR
    typeTxSync-r14SL-TypeTxSync-r14OPTIONAL, -- Need OthresUE-Speed-r14ENUMERATED {kmph60, kmph80, kmph100, kmph120,
    parametersAboveThres-r14 SL-PSSCH-TxParameters. 14
    parametersBelowThres-r14 SL-PSSCH-TxParameters-r14,
    [[ parametersAboveThres-v1530SL-PSSCH-TxParameters-v1530OPTIONAL,--Need ORparametersBelowThres-v1530SL-PSSCH-TxParameters-v1530OPTIONAL--Need OR
    ]]
}
SL-PSSCH-TxParameters-r14 ::=
                                     SEQUENCE {
    minMCS-PSSCH-r14 INTEGER (0..31),
    maxMCS-PSSCH-r14
                                    INTEGER (0..31),
    minSubChannel-NumberPSSCH-r14 INTEGER (1..20),
maxSubchannel-NumberPSSCH-r14 INTEGER (1..20),
    allowedRetxNumberPSSCH-r14 ENUMERATED {n0, n1, both, spare1},
                                   SL-TxPower-r14
                                                                                        -- Cond CBR
    maxTxPower-r14
                                                                    OPTIONAL
}
SL-PSSCH-TxParameters-v1530 ::=
                                        SEQUENCE {
    minMCS-PSSCH-r15 INTEGER (0..31),
maxMCS-PSSCH-r15 INTEGER (0..31)
                                   INTEGER (0..31)
}
```

```
-- ASN1STOP
```

	SL-PSSCH-TxConfigList field descriptions
allowedRetxNumberP	
Indicates the allowed re	etransmission number for transmissions on PSSCH (see TS 36.213 [23]). The value n0
	sion for a transport block allowed; the value n1 indicates that the UE shall perform one
	nsport block, and the value both indicates that the UE may autonomously select no
	etransmission for a transport block.
maxTxPower	· ·
Indicates the maximum	transmission power for transmission on PSSCH and PSCCH (see TS 36.213 [23]).
minMCS-PSSCH, max	
Indicates the minimum	and maximum MCS values used for transmissions on PSSCH (see TS 36.213 [23]). If
	CH-r14 and maxMCS-PSSCH-r14 correspond to the MCS table in Table 8.6.1-1 with 64QAN
indices overridden by 1	6QAM used for transmission on PSSCH. If included, minMCS-PSSCH-r15 and maxMCS-
PSSCH-r15 correspond	to both the MCS table in Table 8.6.1-1 and Table 14.1.1-2 in TS 36.213 [23] used for
transmission on PSSCI	ł. – – – – – – – – – – – – – – – – – – –
minSubchannel-Numl	berPSSCH, maxSubchannel-NumberPSSCH
Indicates the minimum	and maximum number of sub-channels which may be used for transmissions on PSSCH (se
TS 36.213 [23]).	
thresUE-Speed	
Indicates a UE speed th	rreshold.
typeTxSync	
Indicates the synchroni	zation reference type (see TS 36.213 [23]). For configurations by the eNB, only gnss and enl
can be configured; and	for pre-configuration, only gnss and ue can be configured. If the field is absent, the
	ble for all synchronization reference types.
parametersAboveThr	25
Indicates TX parameter	s for the UE speed above thresUE-Speed.
parametersBelowThre	25
	s for the UE speed below thresUE-Speed.

Conditional presence	Explanation
CBR	The field is optionally present, need OR, in IE SL-CBR-CommonTxConfigList-r14, or in IE
	SL-CBR-PreconfigTxConfigList-r14. Otherwise the field is not present. Need OR.

## SL-Reliability

The IE *SL-Reliability* indicates one or more reliabilities of a logical channel group used in case of scheduled sidelink communication resources or traffic reliability(ies) associated with the reported traffic pattern for V2X sidelink communication; see TS 36.321 [6].

## SL-Reliability information element

```
-- ASN1START
SL-ReliabilityList-r15 ::= SEQUENCE (SIZE (1..maxSL-Reliability-r15)) OF SL-Reliability-r15
SL-Reliability-r15 ::= INTEGER (1..8)
-- ASN1STOP
```

#### _

## SL-RestrictResourceReservationPeriodList

The IE *SL-RestrictResourceReservationPeriodList* indicates which values are allowed for the signaling of the resource reservation period in PSCCH for V2X sidelink communication, see TS 36.321 [6].

## SL-RestrictResourceReservationPeriodList information element

```
-- ASN1START

SL-RestrictResourceReservationPeriodList-r14 ::= SEQUENCE (SIZE (1..maxReservationPeriod-r14)) OF

SL-RestrictResourceReservationPeriod-r14 ::= ENUMERATED {v0dot2, v0dot5, v1, v2, v3, v4, v5, v6, v7, v8, v9, v10, spare4, spare3, spare2, spare1}
```

-- ASN1STOP

## SL-RestrictResourceReservationPeriodList field descriptions

SL-RestrictResourceReservationPeriod Value v0dot2 means SL-RestrictResourceReservationPeriod is set to 0.2, value v0dot5 means SL-RestrictResourceReservationPeriod is set to 0.5, value v1 means SL-RestrictResourceReservationPeriod is set to 1, and so on. Value v0dot2 and value v0dot5 are configured in a pool-specific manner only. E-UTRAN should not set value v0dot2 and v0dot5 for transmission pool for P2X related V2X sidelink communication.



__ <u>AGN1</u>GTADT

## SLSSID

The IE *SLSSID* identifies a cell and is used by the receiving UE to detect asynchronous neighbouring cells, and by transmitting UEs to extend the synchronisation signals beyond the cell's coverage area.

## SLSSID information element

ASN1START	
SLSSID-r12 ::=	INTEGER (0167)
ASN1STOP	

## SL-SyncAllowed

The IE *SL-SyncAllowed* indicates the allowed the synchronization references for a transmission resource pool for V2X sidelink communication.

## SL-SyncAllowed information element

ASNISIARI							
SL-SyncAllowed-r14 ::= gnss-Sync-r14 enb-Sync-r14 ue-Sync-r14	SEQUENCE {	ENUMERATED ENUMERATED ENUMERATED	<pre>{true} {true} {true}</pre>	OPTIONAL, OPTIONAL, OPTIONAL	Nee Nee Nee	ed OR	
<pre>} ASN1STOP</pre>							

SL-SyncAllowed field descriptions				
enb-Sync				
If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to eNB (i.e., synchronized to a reference UE which is directly synchronized to eNB).				
gnss-Sync				
If configured, the (pre-) configured resources can be used if the UE is directly or indirectly synchronized to GNSS (i.e. synchronized to a reference UE which is directly synchronized to GNSS).				
ue-Sync				
If configured, the (pre-) configured resources can be used if the UE is synchronized to a reference UE which is synchronized to neither GNSS nor eNB directly or indirectly.				

# SL-SyncConfig

The IE *SL-SyncConfig* specifies the configuration information concerning reception of synchronisation signals from neighbouring cells as well as concerning the transmission of synchronisation signals for sidelink communication and sidelink discovery.

### SL-SyncConfig information element

```
-- ASN1START
                               SEQUENCE (SIZE (1..maxSL-SyncConfig-r12)) OF SL-SyncConfig-r12
SL-SyncConfigList-r12 ::=
SL-SyncConfigListV2X-r14 ::= SEQUENCE (SIZE (1.. maxSL-V2X-SyncConfig-r14)) OF SL-SyncConfig-r12
SL-SyncConfig-r12 ::=
                                       SEOUENCE {
    syncCP-Len-r12
                                           SL-CP-Len-r12,
    syncOffsetIndicator-r12
                                        SL-OffsetIndicatorSync-r12,
    slssid-r12
                                          SLSSID-r12,
                                               SEQUENCE {
    txParameters-r12
        syncTxParameters-r12
                                               SL-TxParameters-r12,
        syncTxThreshIC-r12
                                               RSRP-RangeSL-r12,
                                               BIT STRING (SIZE (19)) OPTIONAL
       syncInfoReserved-r12
                                                                                    -- Need OR
                                                                                    -- Need OR
    }
                                                                       OPTIONAL.
    rxParamsNCell-r12
                                           SEQUENCE {
        physCellId-r12
                                               PhysCellId,
        discSyncWindow-r12 ENUMERATED {w1, w2}
                                                                       OPTIONAL,
    }
                                                                                    -- Need OR
    [[ syncTxPeriodic-r13
                                           ENUMERATED {true}
                                                                       OPTIONAL
                                                                                    -- Need OR
    ]],
    [[ syncOffsetIndicator-v1430 SL-OffsetIndicatorSync-v1430 OPTIONAL,
                                                                                    -- Need OR
                                       ENUMERATED {true}
                                                                       OPTIONAL
       gnss-Sync-r14
                                                                                    -- Need OR
    11,
    II,syncOffsetIndicator2-r14SL-OffsetIndicatorSync-r14OPTIONAL,--Need ORsyncOffsetIndicator3-r14SL-OffsetIndicatorSync-r14OPTIONAL--Need OR
    ]],
                                       ENUMERATED {true}
       slss-TxDisabled-r15
                                                                       OPTIONAL
                                                                                   -- Need OR
    [[
    ]]
}
SL-SyncConfigListNFreq-r13 ::= SEQUENCE (SIZE (1..maxSL-SyncConfig-r12)) OF SL-SyncConfigNFreq-
r13
SL-SyncConfigListNFreqV2X-r14 ::=
                                       SEQUENCE (SIZE (1..maxSL-V2X-SyncConfig-r14)) OF SL-
SyncConfigNFreq-r13
SL-SyncConfigNFreq-r13 ::=
asyncParameters-r13
                                  SEQUENCE {
                                       SEQUENCE {
                                          SL-CP-Len-r12,
       syncCP-Len-r13
                                           SL-OffsetIndicatorSync-r12,
        syncOffsetIndicator-r13
       slssid-r13
                                           SLSSID-r12
                                                                   OPTIONAL, -- Need OR
    txParameters-r13
                                       SEQUENCE {
       syncTxParameters-r13
                                          SL-TxParameters-r12,
        syncTxThreshIC-r13
                                           RSRP-RangeSL-r12,
        syncInfoReserved-r13
                                           BIT STRING (SIZE (19)) OPTIONAL,
                                                                                -- Need OR
                                           ENUMERATED {true}
                                                                               -- Need OR
       syncTxPeriodic-r13
                                                                   OPTIONAL
                                                                   OPTIONAL, -- Need OR
                                       SEQUENCE {
    rxParameters-r13
       discSyncWindow-r13
                                           ENUMERATED {w1, w2}
    }
                                                                       OPTIONAL,
                                                                                   -- Need OR
    . . . ,
```

	[[	syncOffsetIndicator-v1430 gnss-Sync-r14	SL-OffsetIndicatorSync-v143 ENUMERATED {true}	0 OPTIONAL, Need OR OPTIONAL Need OR
	]],			
	[[	<pre>syncOffsetIndicator2-r14 syncOffsetIndicator3-r14</pre>	SL-OffsetIndicatorSync-r14 SL-OffsetIndicatorSync-r14	OPTIONAL, Need OR OPTIONAL Need OR
	]],	-	-	
	[[	slss-TxDisabled-r15	ENUMERATED {true}	OPTIONAL Need OR
}				

-- ASN1STOP

### SL-SyncConfig field descriptions discSyncWindow Indicates the synchronization window over which the UE expects that SLSS or discovery resources indicated by the pool configuration (see TS 36.213 [23], clause 14.4). The value w1 denotes 5 milliseconds. The value w2 denotes the length corresponding to normal cyclic prefix divided by 2. anss-Sync if configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to GNSS, by using slssid=0 and ignoring slssid-r12 configured. If not configured, the synchronization configuration is used for SLSS transmission/reception when the UE is synchronized to eNB, by using the configured slssid-r12. slss-TxDisabled Value TRUE indicates that the carrier, even though equipped with synchronisation resources, cannot be used as a synchronisation carrier frequency to transmit SLSS or PSBCH. This parameter cannot be included in SystemInformationBlockType21 or SystemInformationBlockType26. syncCP-Len In case of V2X sidelink communications this field is always configured to normal. syncInfoReserved Reserved for future use. syncOffsetIndicator E-UTRAN should ensure syncOffsetIndicator is set to the same value as syncOffsetIndicator1 or syncOffsetIndicator2 in preconfigSync within SL-Preconfiguration, if configured. If syncOffsetIndicator-v1430 is configured, the UE shall ignore the field syncOffsetIndicator-r12. E-UTRAN should ensure syncOffsetIndicator is set to the same value as syncOffsetIndicator1 in v2x-CommPreconfigSync within SL-V2X-Preconfiguration, if configured. E-UTRAN should ensure syncOffsetIndicator2 is set to the same value as syncOffsetIndicator2 in v2x-CommPreconfigSync within SL-V2X-Preconfiguration, if configured. E-UTRAN should ensure syncOffsetIndicator3 is set to the same value as syncOffsetIndicator3 in v2x-CommPreconfigSync within SL-V2X-Preconfiguration, if configured. E-UTRAN should ensure all values in syncOffsetIndicator are same across all carrier frequencies configured for UEs performing V2X sidelink communication on multiple carrier frequencies. For SL-V2X-Preconfiguration, all values in syncOffsetIndicator should be same across all carrier frequencies configured for UEs performing V2X sidelink communication on multiple carrier frequencies. svncTxPeriodic Indicates whether in each discovery period in which UE transmits discovery, the UE transmits SLSS once or periodically (i.e. every 40ms). In the latter case (periodic) the UE also transmits the MasterInformationBlock-SL message alongside. E-UTRAN configures this field only for synchronisation configurations applicable for PS discovery. syncTxThreshIC Indicates the threshold used while in coverage. In case the RSRP measurement of the cell chosen for transmission of sidelink communication/ discovery announcements/ V2X sidelink communication, or of the cell used as reference for DL measurements and synchronization, is below the level indicated by this field, the UE may transmit SLSS (i.e. become synchronisation reference) when performing the corresponding sidelink transmission... txParameters Includes parameters relevant only for transmission. E-UTRAN includes the field in one entry per list, as included in commSyncConfig or discSyncConfig.

# SL-TF-ResourceConfig

The IE SL-TF-ResourceConfig specifies a set of time/ frequency resources used for sidelink.

## SL-TF-ResourceConfig information element

-	- ASN1START							
5	L-TF-ResourceConfig-r12 prb-Num-r12 prb-Start-r12 prb-End-r12 offsetIndicator-r12 subframeBitmap-r12	::=	SEÇ	INTEG INTEG SL-Of	ER ER fse	{ (1100 (099) (099) etIndica eBitmaps	, , ator-r1	L2,
5	<pre>SubframeBitmapSL-r12 ::=     bs4-r12     bs8-r12     bs12-r12     bs16-r12     bs30-r12     bs40-r12     bs42-r12</pre>		CHOICE	B B B B	IT IT IT IT IT	STRING STRING STRING STRING STRING STRING	(SIZE (SIZE (SIZE (SIZE (SIZE	<pre>(8)), (12)), (16)), (30)), (40)),</pre>

SubframeBitmapSL-r14	::=	CHOICE {				
bs10-r14			BIT	STRING	(SIZE	(10)),
bs16-r14			BIT	STRING	(SIZE	(16)),
bs20-r14			BIT	STRING	(SIZE	(20)),
bs30-r14			BIT	STRING	(SIZE	(30)),
bs40-r14			BIT	STRING	(SIZE	(40)),
bs50-r14			BIT	STRING	(SIZE	(50)),
bs60-r14			BIT	STRING	(SIZE	(60)),
bs100-r14			BIT	STRING	(SIZE	(100))
}						

```
-- ASN1STOP
```

### SL-TF-ResourceConfig field descriptions

*prb-Start, prb-End, prb-Num* Sidelink transmissions on a sub-frame can occur on PRB with index greater than or equal to *prb-Start* and less than *prb-Start* + *prb-Num*, and on PRB with index greater than *prb-End* - *prb-Num* and less than or equal to *prb-End*. Even for neighbouring cells, *prb-Start* and *prb-End* are relative to PRB #0 of the cell from which it was obtained. See TS 36.213 [23], clauses 14.1.3, 14.2.3 and 14.3.3.

#### subframeBitmap

Indicates the subframe bitmap indicating resources used for sidelink. For sidelink communication, E-UTRAN configures value *bs40* for FDD and the following values for TDD: value *bs42* for configuration0, value *bs16* for configuration1, value *bs8* for configuration2, value *bs12* for configuration3, value *bs8* for configuration4, value *bs4* for configuration5 and value *bs30* for configuration6. For V2X sidelink communication, E-UTRAN configures value *bs16*, *bs20* or *bs100* for FDD or Frame Structure Type 1 as defined in TS 36.211 [21], and the following values for TDD or Frame Structure Type 2 as defined in TS 36.211 [21]: value *bs60* for configuration0, value *bs40* for configuration1, value *bs20* for configuration2, value *bs30* for configuration3, value *bs20* for configuration4, value *bs10* for configuration5 and value *bs50* for configuration6.

## SL-TxPower

The IE *SL-TxPower* is used to limit the UE's sidelink transmission power on a carrier frequency. The unit is dBm. Value minusinfinity corresponds to –infinity.

## SL-TxPower information element

```
-- ASN1START

SL-TxPower-r14 ::= CHOICE {

minusinfinity-r14 NULL,

txPower-r14 INTEGER (-41..31)

}

-- ASN1STOP
```

SL-TypeTxSync

The IE SL-TypeTxSync indicates the synchronization reference type.

### SL-TypeTxSync information element

```
-- ASN1START
SL-TypeTxSync-r14 ::= ENUMERATED {gnss, enb, ue}
-- ASN1STOP
```

# SL-ThresPSSCH-RSRP-List

IE *SL-ThresPSSCH-RSRP-List* indicates a threshold used for sensing based UE autonomous resource selection (see TS 36.213 [23]). A resource is excluded if it is indicated or reserved by a decoded SCI and PSSCH RSRP in the associated data resource is above the threshold defined by IE *SL-ThresPSSCH-RSRP-List*.

## SL-ThresPSSCH-RSRP-List information element

```
-- ASN1START
```

SL-ThresPSSCH-RSRP-List-r14 ::= SEQUENCE (SIZE (64)) OF SL-ThresPSSCH-RSRP-r14 SL-ThresPSSCH-RSRP-r14 ::= INTEGER (0..66)

```
-- ASN1STOP
```

alpha

-- ASN1START

SL-ThresPSSCH-RSRP

## SL-ThresPSSCH-RSRP-List field descriptions

Value 0 corresponds to minus infinity dBm, value 1 corresponds to -128dBm, value 2 corresponds to -126dBm, value n corresponds to (-128 + (n-1)*2) dBm and so on, value 66 corresponds to infinity dBm.

## SL-TxParameters

The IE *SL-TxParameters* identifies a set of parameters configured for sidelink transmission, used for communication, discovery and synchronisation.

## SL-TxParameters information element

ASNISTART		
<pre>SL-TxParameters-r12 ::=     alpha-r12     p0-r12 }</pre>	SEQUENCE { Alpha-r12, P0-SL-r12	
P0-SL-r12 ::=	INTEGER (-12631)	
ASN1STOP		

SL-TxParameters field descriptions

Parameter(s):  $\alpha_{PSSCH,1}$ ,  $\alpha_{PSSCH,2}$ ,  $\alpha_{PSSCH,3}$ ,  $\alpha_{PSSCH,4}$ ,  $\alpha_{PSCCH,1}$ ,  $\alpha_{PSCCH,2}$ ,  $\alpha_{PSDCH,1}$ ,  $\alpha_{PSSS}$  See TS 36.213 [23], clauses 14.1.1.5, 14.2.1.3, 14.3.1 and 14.4, where all corresponds to 0, al04 corresponds to value 0.4, al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1. This field applies for sidelink power control. **p0** Parameter:  $P_{O_PSSCH,1}$ ,  $P_{O_PSSCH,2}$ ,  $P_{O_PSSCH,3}$ ,  $P_{O_PSSCH,4}$ ,  $P_{O_PSSCH,1}$ ,  $P_{O_PSSCH,2}$ ,  $P_{O_PSSCH,1}$ ,  $P_{O_PSSCH,1}$ ,  $P_{O_PSSCH,2}$ , see TS

## SL-TxPoolIdentity

36.213 [23], clauses 14.1.1.5, 14.2.1.3, 14.3.1 and 14.4, unit dBm.

The IE *SL-TxPoolIdentity* identifies an individual pool entry configured for sidelink transmission, used for communication and discovery.

#### SL-TxPoolldentity information element

SL-TxPoolIdentity-r12 ::=	INTEGER (1 maxSL-TxPool-r12)
SL-TxPoolIdentity-v1310 ::=	INTEGER (maxSL-TxPool-r12Plus1-r13 maxSL-TxPool-r13)
SL-V2X-TxPoolIdentity-r14 ::=	<pre>INTEGER (1 maxSL-V2X-TxPool-r14)</pre>
ASN1STOP	

## SL-TxPoolToReleaseList

The IE *SL-TxPoolToReleaseList* is used to release one or more individual pool entries used for sidelink transmission, for communication and discovery.

#### SL-TxPoolToReleaseList information element

```
SL-TxPoolToReleaseList-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-TxPoolIdentity-r12
SL-TxPoolToReleaseListExt-r13 ::= SEQUENCE (SIZE (1..maxSL-TxPool-v1310)) OF SL-TxPoolIdentity-
v1310
```

-- ASN1STOP

-- ASN1START

## SL-V2X-ConfigDedicated

The IE SL-V2X-ConfigDedicated specifies the dedicated configuration information for V2X sidelink communication.

#### -- ASN1START SEOUENCE SL-V2X-ConfigDedicated-r14 ::= { CHOICE { commTxResources-r14 release NULL, setup CHOICE { scheduled-r14 SEQUENCE { sl-V-RNTI-r14 C-RNTI, mac-MainConfig-r14 MAC-MainConfigSL-r12, v2x-SchedulingPool-r14 SL-CommResourcePoolV2X-r14 OPTIONAL, -- Need ON mcs-r14 INTEGER (0..31) OPTIONAL, -- Need OR logicalChGroupInfoList-r14 LogicalChGroupInfoList-r13 }, ue-Selected-r14 SEQUENCE { -- Pool for normal usage v2x-CommTxPoolNormalDedicated-r14 SEQUENCE { poolToReleaseList-r14 SL-TxPoolToReleaseListV2X-r14 OPTIONAL, poolToAddModList-r14 SL-TxPoolToAddModListV2X-r14 C -- Need ON OPTIONAL, Need ON v2x-CommTxPoolSensingConfig-r14 SL-CommTxPoolSensingConfig-r14 OPTTONAL. -- Need ON } } } OPTIONAL, -- Need ON -- Need ON v2x-InterFreqInfoList-r14 SL-InterFreqInfoListV2X-r14 OPTIONAL, SL-Priority-r13 thresSL-TxPrioritization-r14 OPTIONAL, -- Need OR typeTxSync-r14 SL-TypeTxSync-r14 OPTIONAL, -- Need OR SL-CBR-CommonTxConfigList-r14 OPTIONAL, -- Need OR cbr-DedicatedTxConfigList-r14 [[ commTxResources-v1530 CHOICE { release NULL, CHOICE { setup scheduled-v1530 SEQUENCE { logicalChGroupInfoList-v1530 LogicalChGroupInfoList-v1530 OPTIONAL, ___ Need OR mcs-r15 INTEGER (0..31)OPTIONAL -- Need OR }, ue-Selected-v1530 SEQUENCE { v2x-FreqSelectionConfigList-r15 SL-V2X-FreqSelectionConfigList-r15 OPTIONAL --Need OR } } OPTIONAL, -- Need ON v2x-PacketDuplicationConfig-r15 SL-V2X-PacketDuplicationConfig-r15 OPTIONAL, -- Need OR OPTIONAL, SL-V2X-SyncFreqList-r15 syncFreqList-r15 -- Need OR slss-TxMultiFreq-r15 ENUMERATED {true} OPTIONAL -- Need OR ]], [[ slss-TxDisabled-r15 ENUMERATED {true} OPTIONAL -- Need OR

#### SL-V2X-ConfigDedicated information element

}
LogicalChGroupInfoList-v1530 ::= SEQUENCE (SIZE (1maxLCG-r13)) OF SL-ReliabilityList-r15
SL-TxPoolToAddModListV2X-r14 ::= SEQUENCE (SIZE (1 maxSL-V2X-TxPool-r14)) OF SL- TxPoolToAddMod-r14
<pre>SL-TxPoolToAddMod-r14 ::= SEQUENCE {     poolIdentity-r14 SL-V2X-TxPoolIdentity-r14,     pool-r14 SL-CommResourcePoolV2X-r14 }</pre>
SL-TxPoolToReleaseListV2X-r14 ::= SEQUENCE (SIZE (1 maxSL-V2X-TxPool-r14)) OF SL-V2X- TxPoolIdentity-r14

-- ASN1STOP

Γ

## SL-V2X-ConfigDedicated field descriptions

	SL-V2X-ConfigDedicated field descriptions
	dTxConfigList
	ledicated list of CBR range division and the list of PSCCH TX configurations available to configure
congestion cor	ntrol to the UE for V2X sidelink communication.
logicalChGro	upInfoList
	ach logical channel group the list of associated priorities and reliabilities, used as specified in TS 36.32'
	increasing logical channel group identity. If E-UTRAN includes logicalChGroupInfoList-v1530, it include
	ber of entries, and listed in the same order, as in logicalChGroupInfoList-r14, and a logical channel
	of the same entry in logicalChGroupInfoList-r14 and in logicalChGroupInfo-v1530 is associated with
	es (as in logicalChGroupInfoList-r14) and reliablities (as in logicalChGroupInfoList-v-1520) of that entry.
	pupInfoList-v1530 is not included, this field indicates for each logical channel group the list of associated
priorties.	
mcs	
	ICS as defined in TS 36.213 [23], clause 14.2.1. If not configured, the selection of MCS is up to UE
	n. If included, mcs-r14 corresponds to the MCS table in Table 8.6.1-1 with 64QAM indices overridden by
16QAM used f	or transmission on PSSCH. If included, mcs-r15 corresponds to both the MCS table in Table 8.6.1-1 in
	and the MCS table supporting 64QAM in Table 14.1.1-2 in TS 36.213 [23] used for transmission on
	s field is present, E-UTRAN shall configure both mcs-r14 and mcs-r15.
scheduled	
	configuration for the case E-UTRAN schedules the transmission resources based on sidelink specific
BSR from the I	UE.
sI-V-RNTI	
	RNTI used for DCI dynamically scheduling sidelink resources for V2X sidelink communication.
slss-TxDisabl	
	ndicates that the primary carrier, even though equipped with synchronisation resources, cannot be used
	sation carrier frequency to transmit SLSS or PSBCH.
thresSL-TxPr	
	hreshold used to determine whether SL V2X transmission is prioritized over uplink transmission if they
	e (see TS 36.321 [6]). This value shall overwrite <i>thresSL-TxPrioritization</i> configured in SIB21 or SL-V2X
Preconfiguratio	on it any.
typeTxSync	
	prioritized synchronization type (i.e. eNB or GNSS) for performing V2X sidelink communication on PCell
ue-Selected	
	configuration for the case the UE selects the transmission resources from a pool of resources configured
by E-UTRAN.	
v2x-InterFreq	
	hronization and resource allocation configurations of other carrier frequencies than the serving carrier
	/2X sidelink communication. For inter-carrier scheduled resource allocation, CIF=1 in DCI-5A
	the first entry in this frequency list, CIF=2 corresponds to the second entry, and so on (see TS 36.213
	DCI-5A corresponds to the frequency where the DCI is received.
v2x-Schedulii	
Indicates a poo	ol of resources when E-UTRAN schedules Tx resources for V2X sidelink communications.

## SL-V2X-FreqSelectionConfigList

The IE *SL-V2X-FreqSelectionConfigList* specifies the configuration information for carrier selection for V2X sidelink communication transmission using UE autonomous resource selection.

#### SL-V2X-FreqSelectionConfigList information element

```
-- ASN1START
SL-V2X-FreqSelectionConfigList-r15 ::= SEQUENCE (SIZE (1..8)) OF SL-V2X-FreqSelectionConfig-r15
SL-V2X-FreqSelectionConfig-r15 ::= SEQUENCE {
    priorityList-r15 SL-PriorityList-r13,
    threshCBR-FreqReselection-r15 SL-CBR-r14 OPTIONAL, -- Need OR
    threshCBR-FreqKeeping-r15 SL-CBR-r14 OPTIONAL -- Need OR
}
-- ASN1STOP
```

## SL-V2X-FreqSelectionConfig field descriptions

# priorityList Indicates the list of PPPP(s) which is associated with the configurations in threshCBR-FreqReselection and in threshCBR-FreqReselection threshCBR-FreqReselection Indicates the CBR threshold to determine whether the carrier frequency can be (re)selected for the transmission of V2X sidelink communication. See TS 36.321 [6]. threshCBR-FreqReselection Indicates the CBR threshold to determine whether the carrier frequency can be (re)selected for the transmission of V2X sidelink communication. See TS 36.321 [6]. threshCBR-FreqReselection Indicates the CBR threshold to determine whether the UE can keep using the carrier which was selected for the transmission of V2X sidelink communication. See TS 36.321 [6].

## SL-V2X-PacketDuplicationConfig

The IE *SL-V2X-PacketDuplicationConfig* specifies the configuration information for sidelink packet duplication for V2X sidelink communication transmission.

## SL-V2X-PacketDuplicationConfig information element

-- ASN1START

```
SL-V2X-PacketDuplicationConfig-r15 ::= SEQUENCE {
    threshSL-Reliability-r15 SL-Reliability-r15,
allowedCarrierFreqConfig-r15 SL-PPPR-Dest-CarrierFreqList-r15
                                                                                            OPTIONAL.
                                                                                                           -- Need OR
}
SL-PPPR-Dest-CarrierFreqList-r15 ::=
                                              SEQUENCE (SIZE (1..maxSL-Dest-r12)) OF SL-PPPR-Dest-
CarrierFreq
SL-PPPR-Dest-CarrierFreq ::= SEQUENCE {
destinationInfoList-r15 SL-Des
    allowedCarrierFreqList-r15 SL-AllowedCorrier
                                                                                  OPTIONAL,
                                                                                                 -- Need OR
                                                                                      OPTIONAL
                                                                                                         -- Need OR
}
SL-AllowedCarrierFreqList-r15 ::= SEQUENCE {
    allowedCarrierFreqSet1SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9,allowedCarrierFreqSet2SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9
}
-- ASN1STOP
```

SL-V2X-PacketDuplicationConfig field descriptions					
allowedCarrierFreqList, allowedCarrierFreqSet1, allowedCarrierFreqSet2					
Indicates, for V2X sidelink communication, the set of carrier frequencies applicable for the transmission of the MAC					
SDUs from the sidelink logical channels whose associated destination are included in <i>destinationInfoList</i> (see TS					
36.321 [6]). If present, E-UTRAN shall ensure <i>allowedCarrierFreqSet1</i> and <i>allowedCarrierFreqSet2</i> do not include the					
same carrier frequency.					
threshSL-Reliability					
Indicates the reliability threshold used to determine whether sidelinik packet duplication is configured and activated for					
V2X sidelink communication transmission. See TS 36.323 [8] and TS 36.321 [6].					

## SL-V2X-SyncFreqList

The IE *SL-V2X-SyncFreqList* specifies the list of candidate synchronisation carrier frequencies used for V2X sidelink communication.

#### SL-V2X-SyncFreqList information element

```
    ASN1START
    SL-V2X-SyncFreqList-r15 ::= SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF ARFCN-ValueEUTRA-r9
    ASN1STOP
```

SL-ZoneConfig

The IE SL-ZoneConfig indicates zone configurations used for V2X sidelink communication.

### SL-ZoneConfig information element

```
SL-ZoneConfig-r14 ::= SEQUENCE {
   zoneLength-r14 ENUMERATED { m5, m10, m20, m50, m100, m200, m500, spare1},
   zoneWidth-r14 ENUMERATED { m5, m10, m20, m50, m100, m200, m500, spare1},
   zoneIdLongiMod-r14 INTEGER (1..4),
   zoneIdLatiMod-r14 INTEGER (1..4)
}
```

-- ASN1STOP

-- ASN1START

#### SL-ZoneConfig field descriptions

*zoneLength* Indicates the length of each geographic zone. Value m5 corresponds to 5 meters, m10 corresponds to 10 meters and so on.

#### zoneWidth

Indicates the width of each geographic zone. Value m5 corresponds to 5 meters, m10 corresponds to 10 meters and so on.

## zoneldLongiMod

Indicates the total number of zones that is configured with respect to longitude.

## zoneldLatiMod

Indicates the total number of zones that is configured with respect to latitude.

# 6.4 RRC multiplicity and type constraint values

## Multiplicity and type constraint definitions

#### -- ASN1START

maxAccessCat-1-r15	INTEGER ::= 63		Maximum number of Access Categories - 1
maxACDC-Cat-r13	INTEGER ::= 16		Maximum number of ACDC categories (per PLMN)
maxAvailNarrowBands-r13	INTEGER ::= 16		Maximum number of narrowbands
maxBandComb-r10	INTEGER ::= 12	8	Maximum number of band combinations.

maxBandComb-r11				Maximum number of additional band combinations.
maxBandComb-r13				Maximum number of band combinations in Rel-13
maxBands				Maximum number of bands listed in EUTRA UE caps
maxBandsNR-r15	INTEGER	::= 1	.024	Maximum number of NR bands listed in EUTRA UE
caps		-	~	
maxBandwidthClass-r10				Maximum number of supported CA BW classes per band
maxBandwidthCombSet-r10	INTEGER	::= 3		Maximum number of bandwidth combination sets per
				supported band combination
maxBarringInfoSet-r15	INTEGER			Maximum number of UAC barring information sets
maxBT-IdReport-r15 maxBT-Name-r15	INTEGER			Maximum number of Bluetooth IDs to report
maxBI-Name-ri5 maxCBR-Level-r14				Maximum number of Bluetooth name Maximum number of CBR levels
maxCBR-Level-1-r14 maxCBR-Level-1-r14	INTEGER			Maximum number of CBR levels
				Maximum number of CBR results in a report
maxCBR-Report-r14 maxCDMA-BandClass				Maximum number of CBR results in a report Maximum value of the CDMA band classes
maxCE-Level-r13	INTEGER			Maximum number of CE levels
maxCellBlack				Maximum number of blacklisted physical cell identity
Maxceliblack	THIEGER	••- 1		ranges listed in SIB type 4 and 5
maxCellHistory-r12	TNTEGER	::= 1		Maximum number of visited EUTRA cells reported
maxCellInfoGERAN-r9				simum number of GERAN cells for which system in-
MAXCEITIHIOGENAN-IJ	INIEGER ··-	52		formation can be provided as redirection assistance
maxCellInfoUTRA-r9	TNTEGER	::= 1		Maximum number of UTRA cells for which system
	INIDODIC			information can be provided as redirection
				assistance
maxCellMeasIdle-r15	INTEGER	::= 8		Maximum number of neighbouring inter-frequency
	INIDODIC			cells per carrier measured in IDLE mode
maxCombIDC-r11	TNTEGER	::= 1		Maximum number of reported UL CA or
	11120210	-		MR-DC combinations
maxCSI-IM-r11	INTEGER	::= 3		Maximum number of CSI-IM configurations
	11120210	-		(per carrier frequency)
maxCSI-IM-r12	INTEGER	::= 4		Maximum number of CSI-IM configurations
				(per carrier frequency)
minCSI-IM-r13	INTEGER	::= 5		Minimum number of CSI IM configurations from which
				REL-13 extension is used
maxCSI-IM-r13	INTEGER	::= 2	4	Maximum number of CSI-IM configurations
				(per carrier frequency)
maxCSI-IM-v1310	INTEGER	::= 2		Maximum number of additional CSI-IM configurations
				(per carrier frequency)
maxCSI-Proc-r11	INTEGER	::= 4		Maximum number of CSI processes (per carrier
				frequency)
maxCSI-RS-NZP-r11	INTEGER	::= 3		Maximum number of CSI RS resource
				configurations using non-zero Tx power
				(per carrier frequency)
minCSI-RS-NZP-r13	INTEGER	::= 4		Minimum number of CSI RS resource from which
				REL-13 extension is used
maxCSI-RS-NZP-r13	INTEGER	::= 2		Maximum number of CSI RS resource
				configurations using non-zero Tx power
				(per carrier frequency)
maxCSI-RS-NZP-v1310	INTEGER	::= 2		Maximum number of additional CSI RS resource
				configurations using non-zero Tx power
				(per carrier frequency)
maxCSI-RS-ZP-r11	INTEGER	::= 4		Maximum number of CSI RS resource
				configurations using zero Tx power(per carrier
				frequency)
maxCQI-ProcExt-r11	INTEGER	::= 3		Maximum number of additional periodic CQI
				configurations (per carrier frequency)
maxFreqUTRA-TDD-r10	INTEGER	::= 6		Maximum number of UTRA TDD carrier frequencies for
				which system information can be provided as
man (a) ] To the set	THEF			redirection assistance
maxCellInter	INTEGER	::= 1		Maximum number of neighbouring inter-frequency
	THERE	1		cells listed in SIB type 5
maxCellIntra	INTEGER	::= 1		Maximum number of neighbouring intra-frequency
	THERE			cells listed in SIB type 4
maxCellListGERAN	INTEGER			Maximum number of lists of GERAN cells
maxCellMeas	INTEGER	••= 3		Maximum number of entries in each of the
mandallDamant				cell lists in a measurement object
maxCellReport maxCellSFTD	INTEGER			Maximum number of reported cells/CSI-RS resources
maxCellSFTD maxConfigSPS-r14				Maximum number of cells for SFTD reporting Maximum number of simultaneous SPS configurations
-				
maxConfigSPS-r15	INTEGER	••= 6		Maximum number of simultaneous SPS configurations configured with SPS C-RNTI
maxCSI-RS-Meas-r12	ТИФЕСЕР	· · - 0		Maximum number of entries in the CSI-RS list
Marcor Ro-Meas-LIZ	INTEGER	•• 9		in a measurement object
maxDRB	TNTTCFD	::= 1		Maximum number of Data Radio Bearers
maxDRBExt-r15				Maximum number of additional DRBs
maxDRB-r15				Highest value of extended maximum number of DRBs
maxDS-Duration-r12	INTEGER			Maximum number of subframes in a discovery signals
	1111001			occasion

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maxDS-ZTP-CSI-RS-r12	INTEGER	::=	5		Maximum number of zero transmission power CSI-RS for
					a serving cell concerning discovery signals
maxEARFCN					Maximum value of EUTRA carrier frequency
maxEARFCN-Plus1 maxEARFCN2					Lowest value extended EARFCN range Highest value extended EARFCN range
maxEPDCCH-Set-r11					Maximum number of EPDCCH sets
maxFBI					Maximum value of fequency band indicator
maxFBI-NR-r15					Highest value FBI range for NR.
maxFBI-Plus1 maxFBI2					Lowest value extended FBI range Highest value extended FBI range
maxFeatureSets-r15					Total number of feature sets (size of pool)
maxPerCC-FeatureSets-r15	INTEGER	::=	32		Total number of CC-specific feature sets
_			0		(size of the pool)
maxFreq maxFreqIDC-r11	INTEGER				Maximum number of carrier frequencies Maximum number of carrier frequencies that are
manifeqube iii	INIDODIC		52		affected by the IDC problems
maxFreqIdle-r15	INTEGER	::=	8		Maximum number of carrier frequencies for
	THERAPP		-		IDLE mode measurements configured by eNB
maxFreqMBMS-r11	INTEGER	::=	5		Maximum number of carrier frequencies for which an MBMS capable UE may indicate an interest
maxFreqNR-r15	INTEGER	::=	5		Maximum number of NR carrier frequencies for
					which a UE may provide measurement results upon
	THERE		0		NR SCG failure
maxFreqV2X-r14	INTEGER	::=	8		Maximum number of carrier frequencies for which V2X sidelink communication can be configured
maxFreqV2X-1-r14	INTEGER	::=	7		Highest index of frequencies
maxGERAN-SI	INTEGER	::=	10		Maximum number of GERAN SI blocks that can be
AND CHER C	THERE		10		provided as part of NACC information
maxGNFG maxIdleMeasCarriers-r15	INTEGER				Maximum number of GERAN neighbour freq groups Maximum number of neighbouring inter-
	INIDODIC		5		frequency carriers measured in IDLE mode
maxLCG-r13	INTEGER				Maximum number of logical channel groups
maxLogMeasReport-r10	INTEGER	::=	520		Maximum number of logged measurement entries
maxMBSFN-Allocations	INTEGER	::=	8		that can be reported by the UE in one message Maximum number of MBSFN frame allocations with
	INIBOBI	•••	0		different offset
maxMBSFN-Area	INTEGER				
<pre>maxMBSFN-Area-1 maxMBMS-ServiceListPerUE-r1</pre>	INTEGER			1 Г	Maximum number of services which the UE can
MAXMBMS-SELVICELISCPELOE-LI	5 1111	GER			lude in the MBMS interest indication
maxMeasId	INTEGER	::=			
maxMeasId-Plus1	INTEGER				
maxMeasId-r12 maxMultiBands	INTEGER INTEGER				Maximum number of additional frequency bands
MaxMultiballus	INIEGER	••-	0		that a cell belongs to
maxMultiBandsNR-r15	INTEGER	::=	32		Maximum number of additional NR frequency bands
			21		that a cell belongs to
maxMultiBandsNR-1-r15 maxNS-Pmax-r10	INTEGER INTEGER				Maximum number of NS and P-Max values per band
maxNAICS-Entries-r12	INTEGER				Maximum number of supported NAICS combination(s)
maxNeighCell-r12	INTEGER	::=	8		Maximum number of neighbouring cells in NAICS
	THERE		0		configuration (per carrier frequency)
maxNeighCell-SCPTM-r13 maxNrofS-NSSAI-r15	INTEGER INTEGER				Maximum number of SCPTM neighbour cells Maximum number of S-NSSAI
maxObjectId	INTEGER				Maximum Mulber of B NOBAL
maxObjectId-Plus1-r13	INTEGER				
maxObjectId-r13	INTEGER				Movimum number of normal officiate former with the second
maxP-a-PerNeighCell-r12	INTEGER	••=	3		Maximum number of power offsets for a neighbour cell in NAICS configuration
maxPageRec	INTEGER	: : =	16		
maxPhysCellIdRange-r9	INTEGER				Maximum number of physical cell identity ranges
maxPLMN-r11 maxPLMN-1-r14	INTEGER INTEGER				Maximum number of PLMNs Maximum number of PLMNs minus one
maxPLMN-1-r14 maxPLMN-r15	INTEGER				Maximum number of PLMNs minus one Maximum number of PLMNs for RNA configuration
maxPLMN-NR-r15					Maximum number of NR PLMNs
maxPNOffset					Maximum number of CDMA2000 PNOffsets
maxPMCH-PerMBSFN	INTEGER				Maximum number of DECOU TY configurations
maxPSSCH-TxConfig-r14 maxQuantSetsNR-r15	INTEGER				Maximum number of PSSCH TX configurations Maximum number of NR quantity configuration sets
maxQCI-r13	INTEGER				Maximum number of QCIs
maxRAT-Capabilities	INTEGER	::=	8		Maximum number of interworking RATs (incl EUTRA)
maxRE-MapQCL-r11	INTEGER	::=	4		Maximum number of PDSCH RE Mapping configurations
maxReportConfigId	INTEGER	::=	32		(per carrier frequency)
maxReservationPeriod-r14	INTEGER				Maximum number of resource reservation periodicities
					for sidelink V2X communication
maxRS-Index-r15 maxRS-Index-1-r15					Maximum number of RS indices Highest value of RS index as used to identify
MAND THREY-I-IID	TNIEGEK	••=	03		ingreat value of no finder as used to fuelitify

maxRS-IndexCellQual-r15	INTEGER ::	= 10	5	RS index in RRM reports. Maximum number of RS indices averaged to derive
maxRS-IndexReport-r15			2	cell quality for RRM. Maximum number of RS indices for RRM.
maxRSTD-Freq-r10	INTEGER ::			Maximum number of frequency layers for RSTD measurement
maxSAI-MBMS-r11				Maximum number of MBMS service area identities broadcast per carrier frequency
maxSCell-r10	INTEGER ::			Maximum number of SCells
maxSCell-r13				Highest value of extended number range of SCells
maxSCellGroups-r15	INTEGER ::	= 4		Maximum number of SCell common parameter groups
maxSC-MTCH-r13	INTEGER ::	= 10	123	Maximum number of SC-MTCHs in one cell
maxSC-MTCH-BR-r14				Maximum number of SC-MTCHs in one cell for feMTC
maxSL-CommRxPoolNFreq-r13				Maximum number of individual sidelink communication
maxSL-CommRxPoolPreconf-v133		D •		Rx resource pools on neighbouring freq Maximum number of additional preconfigured
maxSL-TxPool-r12Plus1-r13	INTEGER ::			sidelink communication Rx resource pool entries First additional individual sidelink
				Tx resource pool
maxSL-TxPool-v1310	INTEGER ::	= 4		Maximum number of additional sidelink Tx resource pool entries
maxSL-TxPool-r13	INTEGER ::	= 8		Maximum number of individual sidelink Tx resource pools
maxSL-CommTxPoolPreconf-v13	10 INTEGE	R :	:= 7	Maximum number of additional preconfigured sidelink Tx resource pool entries
maxSL-Dest-r12 INT	EGER ::= 16			Maximum number of sidelink destinations
maxSL-DiscCells-r13 INTE	EGER ::= 16			Maximum number of cells with similar sidelink configurations
maxSL-DiscPowerClass-r12				Maximum number of sidelink power classes
maxSL-DiscRxPoolPreconf-r13	INTEGE	R :	:= 16	Maximum number of preconfigured sidelink discovery Rx resource pool entries
	10			
maxSL-DiscSysInfoReportFreq	-ri3 intege	R :	.= 8	Maximum number of frequencies to include in a SidelinkUEInformation for SI reporting
maxSL-DiscTxPoolPreconf-r13	INTEGE	R :	= 4	Maximum number of preconfigured sidelink discovery Tx resource pool entries
maxSL-GP-r13 INTE	EGER ::= 8			imum number of gap patterns that can be requested a frequency or assigned
maxSL-PoolToMeasure-r14 INT	EGER ::= 72			imum number of TX resource pools for CBR measurement and report
maxSL-Prio-r13 INT	EGER ::= 8		Morr	imum number of entries in sidelink priority list
maxSL-RxPool-r12 pools				Maximum number of individual sidelink Rx resource
-	EGER ::= 8		- Max	imum number of entries in sidelink reliability list
maxSL-SyncConfig-r12				Maximum number of sidelink Sync configurations
				imum number of sidelink Time Freq resource index
				pairs
maxSL-TxPool-r12	INTEGER ::	= 4		Maximum number of individual sidelink Tx resource
pools				
maxSL-V2X-RxPool-r14	INTEGER ::	= 10	5	Maximum number of RX resource pools for V2X sidelink communication
maxSL-V2X-RxPoolPreconf-r14	INTEGER ::	= 10	5	Maximum number of RX resource pools for V2X sidelink communication
maxSL-V2X-TxPool-r14	INTEGER ::	= 8		Maximum number of TX resource pools for
				V2X sidelink communication
maxSL-V2X-TxPoolPreconf-r14	INTEGER ::	= 8		Maximum number of TX resource pools for V2X sidelink communication
maxSL-V2X-SyncConfig-r14	INTEGER ::	= 10	5	Maximum number of sidelink Sync configurations for V2X sidelink communication
maxSL-V2X-CBRConfig-r14	INTEGER ::	= 4		Maximum number of CBR range configurations for V2X sidelink communication congestion
				control
maxSL-V2X-CBRConfig-1-r14	INTEGER ::			
maxSL-V2X-TxConfig-r14	INTEGER ::	= б4	1	Maximum number of TX parameter configurations
				for V2X sidelink communication congestion
				control
maxSL-V2X-TxConfig-1-r14	INTEGER ::	= 63	3	
maxSL-V2X-CBRConfig2-r14	INTEGE	R :	= 8	Maximum number of CBR range configurations in
				pre-configuration for V2X sidelink
	TNIMPORT	_		communication congestion control
maxSL-V2X-CBRConfig2-1-r14	INTEGER ::			
maxSL-V2X-TxConfig2-r14	INTEGER ::	= 12	28	Maximum number of TX parameter
				configurations in pre-configuration for V2X
			7.7	sidelink communication congestion control
		= 12	27	
maxSL-V2X-TxConfig2-1-r14	INTEGER ::			
maxSTAG-r11	INTEGER ::	= 3		Maximum number of STAGs
	INTEGER :: INTEGER ::	= 3 = 5		Maximum number of Serving cells
maxSTAG-r11	INTEGER :: INTEGER ::	= 3 = 5		
maxSTAG-r11 maxServCell-r10	INTEGER :: INTEGER ::	= 3 = 5		Maximum number of Serving cells

maxServCellNR-r15			Maximum number of NR serving cells
maxServiceCount	INTEGER ::= 16	]	Maximum number of MBMS services that can be included
			in an MBMS counting request and response
maxServiceCount-1	INTEGER ::=	15	
maxSessionPerPMCH	INTEGER ::=	29	
maxSessionPerPMCH-1	INTEGER ::=	28	
maxSIB	INTEGER ::=	32	Maximum number of SIBs
maxSIB-1	INTEGER ::=	31	
maxSI-Message	INTEGER ::=	32	Maximum number of SI messages
maxSimultaneousBands-r10	) INTEGER ::=	64	Maximum number of simultaneously aggregated bands
maxSubframePatternIDC-r1	11 INTEGER ::=	8	Maximum number of subframe reservation patterns
			that the UE can simultaneously recommend to the
			E-UTRAN for use.
maxTrafficPattern-r14	INTEGER ::=	8	Maximum number of periodical traffic patterns
			that the UE can simultaneously report to the
			E-UTRAN.
maxUTRA-FDD-Carrier	INTEGER ::=	16	Maximum number of UTRA FDD carrier frequencies
maxUTRA-TDD-Carrier	INTEGER ::=	16	Maximum number of UTRA TDD carrier frequencies
maxWayPoint-r15	INTEGER ::=	20	Maximum number of flight path information waypoints
maxWLAN-Id-r12	INTEGER ::=	16	Maximum number of WLAN identifiers
maxWLAN-Bands-r13	INTEGER ::=	8	Maximum number of WLAN bands
maxWLAN-Id-r13	INTEGER ::=	32	Maximum number of WLAN identifiers
maxWLAN-Channels-r13	INTEGER ::=	16	maximum number of WLAN channels used in
			WLAN-CarrierInfo
maxWLAN-CarrierInfo-r13	INTEGER ::= 8	]	Maximum number of WLAN Carrier Information
maxWLAN-Id-Report-r14	INTEGER ::=	32	Maximum number of WLAN IDs to report
maxWLAN-Name-r15	INTEGER ::=	4	Maximum number of WLAN name

-- ASN1STOP

NOTE: The value of maxDRB aligns with SA2.

## End of EUTRA-RRC-Definitions

-- ASN1START

END

-- ASN1STOP

# 6.5 PC5 RRC messages

NOTE: The messages included in this clause reflect the current status of the discussions. Additional messages may be included at a later stage.

## 6.5.1 General message structure

## – PC5-RRC-Definitions

This ASN.1 segment is the start of the PC5 RRC PDU definitions.

```
-- ASN1START
```

```
PC5-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=
```

BEGIN

```
IMPORTS
TDD-ConfigSL-r12
FROM EUTRA-RRC-Definitions;
```

-- ASN1STOP

## SBCCH-SL-BCH-Message

The *SBCCH-SL-BCH-Message* class is the set of RRC messages that may be sent from the UE to the UE via SL-BCH on the SBCCH logical channel.

```
-- ASN1START

SBCCH-SL-BCH-Message ::= SEQUENCE {

message SBCCH-SL-BCH-MessageType

}

SBCCH-SL-BCH-MessageType ::= MasterInformationBlock-SL

-- ASN1STOP
```

## SBCCH-SL-BCH-Message-V2X

The *SBCCH-SL-BCH-Message-V2X* class is the set of RRC messages that may be sent from the UE to the UE via SL-BCH on the SBCCH logical channel for V2X sidelink communication.

```
-- ASN1START

SBCCH-SL-BCH-Message-V2X-r14 ::= SEQUENCE {

message SBCCH-SL-BCH-MessageType-V2X-r14

}

SBCCH-SL-BCH-MessageType-V2X-r14 ::= MasterInformationBlock-SL-V2X-r14

-- ASN1STOP
```

## 6.5.2 Message definitions

```
MasterInformationBlock-SL
```

The *MasterInformationBlock-SL* includes the information transmitted by a UE transmitting SLSS, i.e. acting as synchronisation reference, via SL-BCH.

Signalling radio bearer: N/A

RLC-SAP: TM

_

Logical channel: SBCCH

Direction: UE to UE

## MasterInformationBlock-SL

```
-- ASN1START
```

```
MasterInformationBlock-SL ::=
                                       SEQUENCE {
                                       ENUMERATED {
    sl-Bandwidth-r12
                                               n6, n15, n25, n50, n75, n100},
    tdd-ConfigSL-r12
                                           TDD-ConfigSL-r12,
    tdd-ConfigSL-r12
directFrameNumber-r12
directSubframeNumber-r12
                                         BIT STRING (SIZE (10)),
                                           INTEGER (0..9),
    directSubframeNumber-r12
    inCoverage-r12
                                           BOOLEAN,
                                           BIT STRING (SIZE (19))
    reserved-r12
}
```

```
-- ASN1STOP
```

MasterInformationBlock-SL field descriptions
directFrameNumber
Indicates the frame number in which SLSS and SL-BCH are transmitted. The subframe in the frame corresponding to <i>directFrameNumber</i> is indicated by <i>directSubframeNumber</i> .
inCoverage
Value TRUE indicates that the UE transmitting the MasterInformationBlock-SL is in E-UTRAN coverage.
sl-Bandwidth
Parameter: transmission bandwidth configuration. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and
so on.

## MasterInformationBlock-SL-V2X

The *MasterInformationBlock-SL-V2X* includes the information transmitted by a UE transmitting SLSS, i.e. acting as synchronisation reference, via SL-BCH for V2X sidelink communication.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: SBCCH

Direction: UE to UE

#### MasterInformationBlock-SL-V2X

```
-- ASN1START
```

```
MasterInformationBlock-SL-V2X-r14 ::= SEQUENCE {
    sl-Bandwidth-r14 ENUMERATED {
        n6, n15, n25, n50, n75, n100},
    tdd-ConfigSL-r14 TDD-ConfigSL-r12,
    directFrameNumber-r14 BIT STRING (SIZE (10)),
    directSubframeNumber-r14 INTEGER (0..9),
    inCoverage-r14 BOOLEAN,
    reserved-r14 BIT STRING (SIZE (27))
}
```

-- ASN1STOP

#### MasterInformationBlock-SL-V2X field descriptions

 directFrameNumber

 Indicates the frame number in which SLSS and SL-BCH for V2X sidelink communication are transmitted. The subframe in the frame corresponding to *directFrameNumber* is indicated by *directSubframeNumber*.

 *inCoverage* 

 Value *TRUE* indicates that the UE transmitting the *MasterInformationBlock-SL-V2X* for V2X sidelink communication is in E-UTRAN coverage.

 *sI-Bandwidth* 

 Parameter: transmission bandwidth configuration. n6 corresponds to 6 resource blocks, n15 to 15 resource blocks and so on.

## End of PC5-RRC-Definitions

-- ASN1START

END

-- ASN1STOP

# 6.6 Direct Indication Information

Direct Indication information is transmitted on MPDCCH using P-RNTI but without associated *Paging* message. Table 6.6-1 defines the Direct Indication information, see TS 36.212 [22], clause 5.3.3.1.14.

When bit n is set to 1, UE shall behave as if the corresponding field is set in the *Paging* message, see 5.3.2.3. Bit 1 is the least significant bit.

Bit	Direct Indication information
1	systemInfoModification
2	etws-Indication
3	cmas-Indication
4	eab-ParamModification
5	systemInfoModification-eDRX
6, 7, 8	Not used, and shall be ignored by UE if received.

Table 6.6-1: Direct Indication information

# 6.6a Direct Indication FeMBMS

On MBMS-dedicated cell and on FeMBMS/Unicast-mixed cell, a Direct Indication FeMBMS is transmitted on PDCCH together with 8-bit MCCH change notification using M-RNTI, see TS 36.212 [22], clause 5.3.3.1.4. Table 6.6a-1 defines the Direct Indication FeMBMS.

When the first bit is set to 1, UE shall behave as if *systemInfoModification* field is set in the *Paging* message and when the second bit is set to 1, UE shall behave as if both *etws-Indication* and *cmas-Indication* are set in the *Paging* message, see 5.3.2.3. Bit 1 is the least significant bit.

	Table 6.6a-1:	Direct	Indication	FeMBMS
--	---------------	--------	------------	--------

Bit	Direct Indication FeMBMS		
1	systemInfoModification		
2	etws-Indication and cmas-Indication		

# 6.7 NB-IoT RRC messages

## 6.7.1 General NB-IoT message structure

#### -- ASN1START

NBIOT-RRC-Definitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

```
IMPORTS
    RRCConnectionReestablishmentReject,
    SecurityModeCommand,
    SecurityModeComplete,
    SecurityModeFailure,
    AdditionalSpectrumEmission,
    ARFCN-ValueEUTRA-r9,
    CellIdentity,
    C-RNTI,
    DedicatedInfoNAS,
    DRB-Identity,
    InitialUE-Identity,
    IntraFreqBlackCellList,
    IntraFreqNeighCellList,
    maxBands,
    maxCellBlack.
    maxCellInter,
```

maxCellIntra, maxFBI2, maxFreq. maxMultiBands, maxPageRec, maxPLMN-r11, maxSAI-MBMS-r11, maxSIB, maxSIB-1, MBMS-SAI-r11, MBMS-SAI-List-r11, MBMSSessionInfo-r13, NextHopChainingCount, PagingUE-Identity, PLMN-Identity, P-Max, PowerRampingParameters, PreambleTransMax, PhysCellId, Q-OffsetRange, Q-QualMin-r9 Q-RxLevMin, ReestabUE-Identity, RegisteredMME, ReselectionThreshold, ResumeIdentity-r13, RRC-TransactionIdentifier, RSRP-Range, ShortMAC-I, S-TMSI, SystemInformationBlockType16-r11, SystemInfoValueTagSI-r13, T-Reordering, TimeAlignmentTimer, TMGI-r9, TrackingAreaCode, DataInactivityTimer-r14

FROM EUTRA-RRC-Definitions;

-- ASN1STOP

## BCCH-BCH-Message-NB

The *BCCH-BCH-Message-NB* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via BCH on the BCCH logical channel in FDD.

```
-- ASN1START
BCCH-BCH-Message-NB ::= SEQUENCE {
message BCCH-BCH-MessageType-NB
}
BCCH-BCH-MessageType-NB::= MasterInformationBlock-NB
```

-- ASN1STOP

## - BCCH-BCH-Message-TDD-NB

The *BCCH-BCH-Message-TDD-NB* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via BCH on the BCCH logical channel in TDD.

```
-- ASN1START

BCCH-BCH-Message-TDD-NB ::= SEQUENCE {

    message BCCH-BCH-MessageType-TDD-NB-r15

}

BCCH-BCH-MessageType-TDD-NB-r15 ::= MasterInformationBlock-TDD-NB-r15
```

-- ASN1STOP

## BCCH-DL-SCH-Message-NB

The *BCCH-DL-SCH-Message-NB* class is the set of RRC messages that may be sent from the E-UTRAN to the UE via DL-SCH on the BCCH logical channel.

```
-- ASN1START
BCCH-DL-SCH-Message-NB ::= SEQUENCE {
   message
                           BCCH-DL-SCH-MessageType-NB
}
BCCH-DL-SCH-MessageType-NB ::= CHOICE {
                           CHOICE {
   c1
       systemInformation-r13
                                            SystemInformation-NB,
       systemInformationBlockType1-r13
                                           SystemInformationBlockType1-NB
    },
   messageClassExtension SEQUENCE { }
}
-- ASN1STOP
```

## PCCH-Message-NB

The *PCCH-Message-NB* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the PCCH logical channel.

## DL-CCCH-Message-NB

The *DL-CCCH-Message-NB* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the downlink CCCH logical channel.

```
-- ASN1START
DL-CCCH-Message-NB ::= SEQUENCE {
                           DL-CCCH-MessageType-NB
    message
}
DL-CCCH-MessageType-NB ::= CHOICE {
    c1
                            CHOICE {
        rrcConnectionReestablishment-r13
                                                RRCConnectionReestablishment-NB,
       rrcConnectionReestablishmentReject-r13 RRCConnectionReestablishmentReject,
                                      RRCConnectionReject-NB,
RRCConnectionSetup-NB,
        rrcConnectionReject-r13
        rrcConnectionSetup-r13
        rrcEarlyDataComplete-r15
                                                RRCEarlyDataComplete-NB-r15,
        spare3 NULL, spare2 NULL, spare1 NULL
    },
   messageClassExtension SEQUENCE {}
}
-- ASN1STOP
```

## DL-DCCH-Message-NB

The *DL-DCCH-Message-NB* class is the set of RRC messages that may be sent from the E-UTRAN to the UE on the downlink DCCH logical channel.

```
-- ASN1START
```

```
-- ASN1STOP
```

## UL-CCCH-Message-NB

The *UL-CCCH-Message-NB* class is the set of RRC messages that may be sent from the UE to the E-UTRAN on the uplink CCCH logical channel.

```
-- ASN1START
UL-CCCH-Message-NB ::= SEQUENCE {
    message UL-CCCH-MessageType-NB
}
UL-CCCH-MessageType-NB ::= CHOICE {
    c1 CHOICE {
        rrcConnectionReestablishmentRequest-r13 RRCConnectionReestablishmentRequest-NB,
        rrcConnectionReguest-r13 RRCConnectionReguest-NB,
        rrcConnectionResumeRequest-r13 RRCConnectionResumeRequest-NB,
        rrcEarlyDataRequest-r15 RRCEarlyDataRequest-NB-r15
    },
    messageClassExtension SEQUENCE {}
```

## SC-MCCH-Message-NB

The SC-MCCH-Message-NB class is the set of RRC messages that may be sent from the E-UTRAN to the NB-IoT UE on the SC-MCCH logical channel.

```
-- ASN1START
SC-MCCH-Message-NB ::= SEQUENCE {
    message SC-MCCH-MessageType-NB
}
SC-MCCH-MessageType-NB ::= CHOICE {
    cl CHOICE {
        scptmConfiguration-r14 SCPTMConfiguration-NB-r14
    },
    messageClassExtension SEQUENCE {}
```

## UL-DCCH-Message-NB

The *UL-DCCH-Message-NB* class is the set of RRC messages that may be sent from the UE to the E-UTRAN on the uplink DCCH logical channel.

```
-- ASN1START
UL-DCCH-Message-NB ::= SEQUENCE {
                           UL-DCCH-MessageType-NB
   message
}
UL-DCCH-MessageType-NB ::= CHOICE {
                            CHOICE {
   c1
       rrcConnectionReconfigurationComplete-r13 RRCConnectionReconfigurationComplete-NB,
       rrcConnectionReestablishmentComplete-r13 RRCConnectionReestablishmentComplete-NB,
                                         RRCConnectionSetupComplete-NB,
SecurityModeComplete,
       rrcConnectionSetupComplete-r13
       securityModeComplete-r13
        securityModeFailure-r13
                                                   SecurityModeFailure,
        ueCapabilityInformation-r13
                                                   UECapabilityInformation-NB,
       ulInformationTransfer-r13
                                                   ULInformationTransfer-NB,
        rrcConnectionResumeComplete-r13
                                                   RRCConnectionResumeComplete-NB,
        spare8 NULL, spare7 NULL,
        spare6 NULL, spare5 NULL, spare4 NULL,
       spare3 NULL, spare2 NULL, spare1 NULL
    },
   messageClassExtension SEQUENCE {}
}
-- ASN1STOP
```

## 6.7.2 NB-IoT Message definitions

DLInformationTransfer-NB

The DLInformationTransfer-NB message is used for the downlink transfer of NAS dedicated information.

Signalling radio bearer: SRB1or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

#### DLInformationTransfer-NB message

```
-- ASN1START
```

```
DLInformationTransfer-NB ::=
                              SEQUENCE {
                              RRC-TransactionIdentifier,
   rrc-TransactionIdentifier
   criticalExtensions
                                     CHOICE {
                                         CHOICE {
       с1
           dlInformationTransfer-r13
                                         DLInformationTransfer-NB-r13-IEs,
           sparel NULL
       },
       criticalExtensionsFuture
                                        SEQUENCE { }
   }
}
DLInformationTransfer-NB-r13-IEs ::=
                                    SEQUENCE {
   dedicatedInfoNAS-r13
                                       DedicatedInfoNAS,
   lateNonCriticalExtension
                                                                        OPTIONAL,
                                         OCTET STRING
   nonCriticalExtension
                                          SEQUENCE { }
                                                                         OPTIONAL
}
-- ASN1STOP
```

## MasterInformationBlock-NB

The MasterInformationBlock-NB includes the system information transmitted on BCH in FDD.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

#### MasterInformationBlock-NB

-- ASN1START

```
MasterInformationBlock-NB ::= SEQUENCE {
     terInformationBlock-NB ::= SEQUENCE {
systemFrameNumber-MSB-r13 BIT STRING (SIZE (4)),
hyperSFN-LSB-r13 BIT STRING (SIZE (2)),
schedulingInfoSIB1-r13 INTEGER (0..15),
systemInfoValueTag-r13 INTEGER (0..31),
ab-Enabled-r13 BOOLEAN,
operationModeInfo-r13 CHOICE {
inband-SamePCI-r13 Inband-SamePCI-NB-r13,
guardband-r13 Guardband-NB-r13,
standalone-r13 Standalone-NB-r13
            standalone-r13
                                                              Standalone-NB-r13
      },
      additionalTransmissionSIB1-r15 BOOLEAN,
                                                         BIT STRING (SIZE (10))
      spare
}
Guardband-NB-r13 ::= SEQUENCE {
rasterOffset-r13 ChannelRasterOffset-NB-r13,
spare BIT STRING (SIZE (3))
}
Inband-SamePCI-NB-r13 ::= SEQUENCE {
      eutra-CRS-SequenceInfo-r13 INTEGER (0..31)
}
Inband-DifferentPCI-NB-r13 ::= SEQUENCE {
      eutra-NumCRS-Ports-r13 ENUMERATED {same, four},
rasterOffset-r13 ChannelRasterOffset-NB-r
                                                         ChannelRasterOffset-NB-r13,
                                                        BIT STRING (SIZE (2))
      spare
}
Standalone-NB-r13 ::= SEQUENCE {
                                                         BIT STRING (SIZE (5))
      spare
}
  - ASN1STOP
```

MasterInformationBlock-NB field descriptions			
ab-Enabled			
Value TRUE indicates that access barring is enabled.			
additionalTransmissionSIB1			
Value TRUE indicates that additional SIB1-NB transmissions are present. See TS 36.211 [21] and TS 36.213 [23]. E-UTRAN only configures <i>additionalTransmissionSIB1</i> to <i>TRUE</i> if <i>schedulingInfoSIB1</i> indicates that the number of NPDSCH repetitions is 16, see TS 36.213 [23], Table 16.4.1.3-3.			
eutra-CRS-SequenceInfo			
Information of the carrier containing NPSS/NSSS/NPBCH.			
Each value is associated with an E-UTRA PRB index as an offset from the middle of the LTE system sorted out by channel raster offset. See TS 36.211[21] and TS 36.213 [23].			
eutra-NumCRS-Ports			
Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23].			
hyperSFN-LSB			
Indicates the 2 least significant bits of hyper SFN. The remaining bits are present in SystemInformationBlockType1- NB.			
operationModeInfo			
Deployment scenario (in-band/guard-band/standalone) and related information. See TS 36.211 [21] and TS 36.213 [23].			
<i>Inband-SamePCI</i> indicates an in-band deployment and that the NB-IoT and LTE cell share the same physical cell id and have the same number of NRS and CRS ports.			
Inband-DifferentPCI indicates an in-band deployment and that the NB-IoT and LTE cell have different physical cell id. guardband indicates a guard-band deployment. standalone indicates a standalone deployment.			
schedulingInfoSIB1			
This field contains an index to a table specified in TS 36.213 [23], Table 16.4.1.3-3, that defines			
SystemInformationBlockType1-NB scheduling information.			
systemFrameNumber-MSB			
Defines the 4 most significant bits of the SFN. As indicated in TS 36.211 [21], the 6 least significant bits of the SFN			
are acquired implicitly by decoding the NPBCH.			
systemInfoValueTag			
Common for all SIBs other than MIB-NB, SIB14-NB and SIB16-NB.			

## MasterInformationBlock-TDD-NB

The MasterInformationBlock-TDD-NB includes the system information transmitted on BCH in TDD.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

#### MasterInformationBlock-TDD-NB

-- ASN1START

```
MasterInformationBlock-TDD-NB-r15 ::= SEQUENCE {
     systemFrameNumber-MSB-r15 BIT STRING (SIZE (4)),
hyperSFN-LSB-r15 BIT STRING (SIZE (2)).
     hyperSFN-LSB-r15
                                                            BIT STRING (SIZE (2)),
          erSFN-LSB-r15BIT STRING (SIZE (2)),edulingInfoSIB1-r15INTEGER (0..15),temInfoValueTag-r15INTEGER (0..31),Enabled-r15BOOLEAN,rationModeInfo-r15CHOICE {inband-SamePCI-r15Inband-SamePCI-TDD-NB-r15,guardband-r15GuardbandTDD-NB-r15,standalone-r15StandaloneTDD-NB-r15,
     schedulingInfoSIB1-r15
     systemInfoValueTag-r15
     ab-Enabled-r15
     operationModeInfo-r15
           standalone-r15
                                                            StandaloneTDD-NB-r15
     },
     sibl-CarrierInfo-r15
                                                            ENUMERATED {anchor, non-anchor},
                                                            BIT STRING (SIZE (9))
     spare
}
GuardbandTDD-NB-r15 ::=
                                                 SEQUENCE {
     rasterOffset-r15
                                                       ChannelRasterOffset-NB-r13,
                                                       CHOICE {
     sib-GuardbandInfo-r15
```

sib-GuardbandAnchor-r15SIB-GuardbandAnchorTDD-NB-r15,sib-GuardbandGuardband-r15SIB-GuardbandGuardbandTDD-NB-r15,sib-GuardbandInbandSamePCI-r15SIB-GuardbandInbandSamePCI-TDD-NB-r15, sib-GuardbandinbandDiffPCI-r15 SIB-GuardbandInbandDiffPCI-TDD-NB-r15 }, ENUMERATED {bw5or10, bw15or20} eutra-Bandwitdh-r15 } Inband-SamePCI-TDD-NB-r15 ::= SEQUENCE { INTEGER (0..31), eutra-CRS-SequenceInfo-r15 sib-InbandLocation-r15 ENUMERATED {lower, higher} } Inband-DifferentPCI-TDD-NB-r15 ::= SEQUENCE {
eutra-NumCRS-Ports-r15 ENUMERA
rasterOffset-r15 Channel
sib-InbandLocation-r15 ENUMERA ENUMERATED {same, four}, ChannelRasterOffset-NB-r13, ENUMERATED {lower, higher}, BIT STRING (SIZE (2)) spare } StandaloneTDD-NB-r15 ::= SEQUENCE { sib-StandaloneLocation-r15 ENUMERATED {lower, higher}, BIT STRING (SIZE (5)) spare } SEQUENCE { SIB-GuardbandAnchorTDD-NB-r15 ::= spare BIT STRING (SIZE (1)) } SEQUENCE { SIB-GuardbandGuardbandTDD-NB-r15 ::= sib-GuardbandGuardbandLocation-r15 ENUMERATED {same, opposite} } SIB-GuardbandInbandSamePCI-TDD-NB-r15 ::= SEQUENCE { spare BIT STRING (SIZE (1)) } SIB-GuardbandInbandDiffPCI-TDD-NB-r15 ::= SEQUENCE { sib-EUTRA-NumCRS-Ports-r15 ENUMERATED {same, four} } -- ASN1STOP

#### MasterInformationBlock-TDD-NB field descriptions ab-Enabled Value TRUE indicates that access barring is enabled. eutra-Bandwidth EUTRA system bandwidth. Value bw5or10 corresponds to bandwidth 5 or 10 MHz, value bw15or20 corresponds to bandwidth 15 or 20 MHz. If the value of eutra-Bandwidth is bw5or10 and rasterOffset is set to khz7dot5 or khz-7dot5, the E-UTRA system bandwidth is 5 MHz If the value of eutra-Bandwidth is bw5or10 and rasterOffset is set to khz2dot5 or khz-2dot5, the E-UTRA system bandwidth is 10 MHz. If the value of eutra-Bandwidth is bw15or20 and rasterOffset is set to khz7dot5 or khz-7dot5, the E-UTRA system bandwidth is 15 MHz. If the value of eutra-Bandwidth is bw15or20 and rasterOffset is set to khz2dot5 or khz-2dot5, the E-UTRA system bandwidth is 20 MHz. When the E-UTRA system bandwidth is 5 MHz or 15 MHz, if the value of sib-GuardbandInfo is sib-GuardbandInbandSamePCI or sib-GuardbandinbandDiffPCI, the offset between the anchor carrier and the nonanchor carrier used for SIB1 and/or SI transmission is 45 kHz. eutra-CRS-SequenceInfo Information of the carrier containing NPSS/NSSS/NPBCH. Each value is associated with an E-UTRA PRB index as an offset from the middle of the LTE system sorted out by channel raster offset. See TS 36.211 [21] and TS 36.213 [23]. eutra-NumCRS-Ports, sib-eutra-NumCRS-Ports Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23]. hyperSFN-LSB Indicates the 2 least significant bits of hyper SFN. The remaining bits are present in SystemInformationBlockType1-NR operationModeInfo Deployment scenario (in-band/guard-band/standalone) and related information. See TS 36.211 [21] and TS 36.213 [23] Inband-SamePCI indicates an in-band deployment and that the NB-IoT and LTE cell share the same physical cell id and have the same number of NRS and CRS ports. Inband-DifferentPCI indicates an in-band deployment and that the NB-IoT and LTE cell have different physical cell id. guardband indicates a guard-band deployment. standalone indicates a standalone deployment. When operationmodeInfo is set to guardband, if rasterOffset is set to khz-7dot5 or khz-2dot5, the guardband anchor carrier is at the higher edge of the LTE carrier. If rasterOffset is set to khz7dot5 or khz2dot5, the guardband anchor carrier is at the lower edge of the LTE carrier schedulingInfoSIB1 This field contains an index to a table specified in TS 36.213 [23], Table 16.4.1.3-5 or Table 16.4.1.3-7 when sib1-CarrierInfo is set to anchor or to non-anchor respectively, that defines SystemInformationBlockType1-NB scheduling information. If sib1-CarrierInfo is set to non-anchor, E-UTRAN configures a value between 0 and 7. sib-GuardbandGuardbandLocation Location of the non-anchor carrier used for SIB1 and/or SI transmission when operationmodeInfo is set to guardband and the non-anchor carrier is in guardband. See TS 36.213 [23]. Value same corresponds to the carrier adjacent to the anchor carrier on the outer side of the guardband, value opposite corresponds to the carrier closest to the edge of the LTE carrier in the opposite guardband. sib-GuardbandInfo Information of the carrier used for SIB1 and/or SI transmission when operationmodeInfo is set to guardband. See TS 36.213 [23]. sib-GuardbandAnchor indicates the anchor carrier. sib-GuardbandGuardband indicates a non-anchor carrier in guardband mode. sib-GuardbandInbandSamePCI or sib-GuardbandinbandDiffPCI indicates a non-anchor carrier in inband mode, and at the edge of the LTE carrier and on the same side as the anchor carrier. sib-InbandLocation Location of the non-anchor carrier used for SIB1 and/or SI transmission when operationmodeInfo is set to inband-SamePCI or inband-DifferentPCI, and sib1-CarrierInfo value and/or tdd-SI-CarrierInfo in SIB1-NB is set to non-anchor. See TS 36.213 [23]. Value lower corresponds to the lower adjacent carrier relative to the anchor carrier and value higher corresponds to the higher adjacent carrier relative to the anchor carrier. If both sib1-CarrierInfo value and tdd-SI-CarrierInfo value in SIB1-NB are set to anchor, the UE ignores sib-InbandLocation.

ETSI

MasterInformationBlock-TDD-NB field descriptions				
sib-StandaloneLocation				
Location of the non-anchor carrier used for SIB1 and/or SI transmission when operationmodeInfo is set to standalone, and sib1-CarrierInfo value and/or tdd-SI-CarrierInfo in SIB1-NB is set to non-anchor. See TS 36.213 [23].				
Value lower corresponds to the lower adjacent carrier relative to the anchor carrier and value higher corresponds to				
the higher adjacent carrier relative to the anchor carrier.				
If both sib1-CarrierInfo value and tdd-SI-CarrierInfo value in SIB1-NB are set to anchor, the UE ignores sib-				
StandaloneLocation.				
sib1-CarrierInfo				
Carrier used for SIB1 transmission. See TS 36.213 [23], clause 16.4.1.3. Value <i>anchor</i> corresponds to anchor carrier, value <i>non-anchor</i> corresponds to non-anchor carrier.				
systemFrameNumber-MSB				
Defines the 4 most significant bits of the SFN. As indicated in TS 36.211 [21], the 6 least significant bits of the SFN				
are acquired implicitly by decoding the NPBCH.				
systemInfoValueTag				
Common for all SIBs other than MIB-NB, SIB14-NB and SIB16-NB.				

_

## Paging-NB

The Paging-NB message is used for the notification of one or more UEs.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: PCCH

Direction: E-UTRAN to UE

#### Paging-NB message

```
-- ASN1START
```

```
Ing-NB ::=SEQUENCE {pagingRecordList-r13PagingRecordList-NB-r13OPTIONAL, -- Need ONsystemInfoModification-r13ENUMERATED {true}OPTIONAL
Paging-NB ::=
   pagingRecordList-r13
                                            ENUMERATED {true} OPTIONAL, -- Need ON
ENUMERATED {true} OPTIONAL, -- Need ON
                                                                                              -- Need ON
    systemInfoModification-eDRX-r13
    nonCriticalExtension
                                            SEQUENCE { }
                                                                                OPTIONAL
}
PagingRecordList-NB-r13 ::= SEQUENCE (SIZE (1..maxPageRec)) OF PagingRecord-NB-r13
PagingRecord-NB-r13 ::=
                                     SEQUENCE {
    ue-Identity-r13
                                            PagingUE-Identity,
    . . .
}
```

-- ASN1STOP

## Paging-NB field descriptions

systemInfoModification
If present: indication of a BCCH modification other than for SystemInformationBlockType14-NB (SIB14-NB) and
SystemInformationBlockType16-NB (SIB16-NB). This indication does not apply to UEs using eDRX cycle longer than
the BCCH modification-eDRX
If present: indication of a BCCH modification other than for SystemInformationBlockType14-NB (SIB14-NB) and
SystemInformationBlockType16-NB (SIB16-NB). This indication applies only to UEs using eDRX cycle longer than the
BCCH modification period.
ue-Identity
Provides the NAS identity of the UE that is being paged.

## RRCConnectionReconfiguration-NB

The *RRCConnectionReconfiguration-NB* message is the command to modify an RRC connection. It may convey information for resource configuration (including RBs, MAC main configuration and physical channel configuration) including any associated dedicated NAS information.

Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

## RRCConnectionReconfiguration-NB message

```
-- ASN1START
RRCConnectionReconfiguration-NB ::= SEQUENCE {
                                 RRC-11 a...
CHOICE {
                                              RRC-TransactionIdentifier,
    rrc-TransactionIdentifier
    criticalExtensions
                                                   CHOICE {
        c1
            rrcConnectionReconfiguration-r13
                                                       RRCConnectionReconfiguration-NB-r13-IEs,
            sparel NULL
        },
        criticalExtensionsFuture
                                              SEQUENCE { }
    }
}
RRCConnectionReconfiguration-NB-r13-IEs ::= SEQUENCE {
                                  SEQUENCE (SIZE(1..maxDRB-NB-r13)) OF
    dedicatedInfoNASList-r13
    radioResourceConfigDedicated-r13 RadioResourceConfi
ENUMERATED {true}
                                                       DedicatedInfoNAS
                                                                                OPTIONAL,
                                                                                             -- Need ON
                                          RadioResourceConfigDedicated-NB-r13 OPTIONAL,
                                                                                              -- Need ON
                                                                                             -- Cond
                                                                                OPTIONAL,
Reestab

    lateNonCriticalExtension
    OCTET STRING

    nonCriticalExtension
    SEQUENCE {}

                                                                                 OPTIONAL,
    nonCriticalExtension
                                          SEQUENCE {} OPTIONAL
}
```

```
-- ASN1STOP
```

#### RRCConnectionReconfiguration-NB field descriptions

*dedicatedInfoNASList* This field is used to transfer UE specific NAS layer information between the network and the UE. The RRC layer is transparent for each PDU in the list.

#### fullConfig

Indicates the full configuration option is applicable for the RRC Connection Reconfiguration message.

Conditional presence	Explanation	
Reestab	This field is optionally present, need ON upon the first reconfiguration after RRC	
	connection re-establishment; otherwise the field is not present.	

## RRCConnectionReconfigurationComplete-NB

The *RRCConnectionReconfigurationComplete-NB* message is used to confirm the successful completion of an RRC connection reconfiguration.

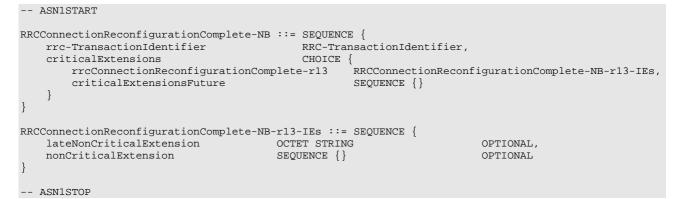
Signalling radio bearer: SRB1

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

#### RRCConnectionReconfigurationComplete-NB message



## RRCConnectionReestablishment-NB

The RRCConnectionReestablishment-NB message is used to re-establish SRB1.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

#### RRCConnectionReestablishment-NB message

```
-- ASN1START
RRCConnectionReestablishment-NB ::= SEQUENCE {
   rrc-TransactionIdentifier RRC-TransactionIdentifier,
   criticalExtensions
                                     CHOICE {
                                         CHOICE {
       c1
           rrcConnectionReestablishment-r13 RRCConnectionReestablishment-NB-r13-IEs,
           sparel NULL
       },
       criticalExtensionsFuture
                                         SEQUENCE { }
   }
}
RRCConnectionReestablishment-NB-r13-IEs ::= SEQUENCE {
   radioResourceConfigDedicated-r13 RadioResourceConfigDedicated-NB-r13,
                                             NextHopChainingCount,
   nextHopChainingCount-r13
   lateNonCriticalExtension
                                             OCTET STRING
                                                                                OPTIONAL.
   nonCriticalExtension
                                             RRCConnectionReestablishment-NB-v1430-IEs
                                                                                      OPTIONAL
}
RRCConnectionReestablishment-NB-v1430-IEs ::= SEQUENCE {
                                     BIT STRING (SIZE (16)) OPTIONAL,
                                                                        -- Cond Reestablish-CP
   dl-NAS-MAC
                                     SEQUENCE { }
   nonCriticalExtension
                                                             OPTIONAL
}
```

-- ASN1STOP

RRCConnectionReestablishment-NB field descriptions	
dI-NAS-MAC	
Downlink authentication token, see TS 33.401 [32]. If this field is present, the UE shall ignore the field	
nextHopChainingCount.	

Conditional presence	esence Explanation	
Reestablish-CP	This field is mandatory present for NB-IoT UE using the Control Plane CIoT EPS	
	optimisation; otherwise the field is not present.	

## RRCConnectionReestablishmentComplete-NB

The *RRCConnectionReestablishmentComplete-NB* message is used to confirm the successful completion of an RRC connection re-establishment.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

## RRCConnectionReestablishmentComplete-NB message

```
-- ASN1START
```

RRCConnectionReestablishmentComplete-NB rrc-TransactionIdentifier criticalExtensions rrcConnectionReestablishmentComp criticalExtensionsFuture } }	RRC-Tran CHOICE	nsactionIdentifier,	blishmentComplete-NB-r13-IEs,	
RRCConnectionReestablishmentComplete-NB- lateNonCriticalExtension nonCriticalExtension }	OCTET STRING		OPTIONAL, plete-NB-v1470-IES OPTIONAL	
RRCConnectionReestablishmentComplete-NB- measResultServCell-r14 nonCriticalExtension }		:= SEQUENCE { ervCell-NB-r14	OPTIONAL, OPTIONAL	

-- ASN1STOP

#### RRCConnectionReestablishmentComplete-NB field descriptions

measResultServCell

This field refers to the last idle mode measurement results taken of the serving cell.

## RRCConnectionReestablishmentRequest-NB

The RRCConnectionReestablishmentRequest-NB message is used to request the reestablishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

## RRCConnectionReestablishmentRequest-NB message

-- ASN1START

```
RRCConnectionReestablishmentRequest-NB ::= SEQUENCE {
                                                     CHOICE {
      criticalExtensions
           rrcConnectionReestablishmentRequest-r13
                                                               RRCConnectionReestablishmentRequest-NB-r13-IEs,
                er
rrcConnectionReestablishmentRequest-r14
RRCConnectionReestablishmentRequest-NB-r14-IEs,
           later
                 criticalExtensionsFuture
           }
     }
}
RRCConnectionReestablishmentRequest-NB-r13-IEs ::= SEQUENCE {
     ConnectionReestablishmentRequest-NB-113-115 ::- 3EQUENCE (ue-Identity-r13ReestabUE-Identity,reestablishmentCause-r13ReestablishmentCause-NB-r13,cqi-NPDCCH-r14CQI-NPDCCH-NB-r14,earlyContentionResolution-r14BOOLEAN,spareBIT STRING (SIZE (20))
}
RRCConnectionReestablishmentRequest-NB-r14-IEs ::= SEQUENCE {
     connectionneestablishmentRequest NB 114 115 NF SQUENCE (ue-Identity-r14ReestabUE-Identity-CP-NB-r14,reestablishmentCause-r14ReestablishmentCause-NB-r13,cqi-NPDCCH-r14CQI-NPDCCH-Short-NB-r14,earlyContentionResolution-r14BOOLEAN,spareBIT STRING (SIZE (1))
}
                                                         ENUMERATED {
ReestablishmentCause-NB-r13 ::=
                                                               reconfigurationFailure, otherFailure,
                                                               spare2, spare1}
ReestabUE-Identity-CP-NB-r14 ::= SEQUENCE {
     s-TMSI-r14
                                                             S-TMSI,
      ul-NAS-MAC-r14
                                                               BIT STRING (SIZE (16)),
                                                               BIT STRING (SIZE (5))
     ul-NAS-Count-r14
}
-- ASN1STOP
```

RRCConnectionReestablishmentRequest-NB field descriptions			
earlyContent	ionResolution		
Value TRUE in	ndicates UE supports MAC PDU containing the UE contention resolution identity MAC control element		
without RRC r	esponse message. This field is always set to TRUE in this version of the specification.		
reestablishm	entCause		
	ailure cause that triggered the re-establishment procedure.		
eNB is not exp	pected to reject a RRCConnectionReestablishmentRequest due to unknown cause value being used by		
the UE.			
ue-Identity			
UE identity inc	sluded to retrieve UE context and to facilitate contention resolution by lower layers.		
ul-NAS-Coun	t		
For description	n of this field see TS 33.401 [32].		
ul-NAS-MAC			
For description	n of this field see TS 33.401 [32].		

## RRCConnectionReject-NB

The *RRCConnectionReject-NB* message is used to reject the RRC connection establishment or RRC connection resume or to reject the EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

## RRCConnectionReject-NB message

ASN1START		
RRCConnectionReject-NB ::= criticalExtensions cl rrcConnectionReject-r13 sparel NULL }.	SEQUENCE { CHOICE { CHOICE { RRCConnectionReject-NB-	r13-IEs,
<pre>criticalExtensionsFuture } </pre>	SEQUENCE {}	
<pre>RRCConnectionReject-NB-r13-IEs ::=     extendedWaitTime-r13     rrc-SuspendIndication-r13     lateNonCriticalExtension     nonCriticalExtension }</pre>	SEQUENCE { INTEGER (11800), ENUMERATED {true} OCTET STRING SEQUENCE {}	OPTIONAL, Need ON OPTIONAL, OPTIONAL

-- ASN1STOP

## RRCConnectionReject-NB field descriptions

extendedWaitTime
Value in seconds.
rrc-SuspendIndication
If present, this field indicates that the UE should remain suspended and not release its stored context.

## RRCConnectionRelease-NB

The *RRCConnectionRelease-NB* message is used to command the release of an RRC connection, or to complete an UP-EDT procedure.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

## RRCConnectionRelease-NB message

```
-- ASN1START
```

RRCConnectionRelease-NB ::= SEQUENC	Έ {		
rrc-TransactionIdentifier	RRC-TransactionIdentifier,		
criticalExtensions	CHOICE {		
cl	CHOICE {		
rrcConnectionRelease-r13 spare1 NULL	RRCConnectionRelease-NE	3-r13-IEs,	
},			
criticalExtensionsFuture	SEQUENCE { }		
}			
}			
RRCConnectionRelease-NB-r13-IEs ::= SEQ	UENCE {		
releaseCause-r13	ReleaseCause-NB-r13,		
resumeIdentity-r13	ResumeIdentity-r13	OPTIONAL,	Need OR
extendedWaitTime-r13	INTEGER (11800)	OPTIONAL,	Need ON
redirectedCarrierInfo-r13	RedirectedCarrierInfo-NB-r13	OPTIONAL,	Need ON

```
lateNonCriticalExtension OCTET STRING
                                                                                   OPTIONAL,
                                             RRCConnectionRelease-NB-v1430-IEs OPTIONAL
    nonCriticalExtension
}
RRCConnectionRelease-NB-v1430-IEs ::= SEQUENCE {
                                            RedirectedCarrierInfo-NB-v1430 OPTIONAL, -- Cond
   redirectedCarrierInfo-v1430
Redirection
   extendedWaitTime-CPdata-r14 INTEGER (1..1800) OPTIONAL, -- Cond NoExtendedWaitTime
   nonCriticalExtension
                                            RRCConnectionRelease-NB-v1530-IEs OPTIONAL
}
RRCConnectionRelease-NB-v1530-IEs ::= SEQUENCE {

    ConnectionRelease ND visco ----
    ENUMERATED {true}
    OPTIONAL,

    drb-ContinueROHC-r15
    NextHopChainingCount
    OPTIONAL,

    nextHopChainingCount-r15
    NextHopChainingCount
    OPTIONAL,

    nextHopChainingCount
    RRCConnectionRelease-NB-v1550-IEs
    OPTIONAL

                                                 ENUMERATED {true} OPTIONAL, -- Cond UP-EDT
NextHopChainingCount OPTIONAL, -- Cond UP-EDT
}
RRCConnectionRelease-NB-v1550-IEs ::= SEQUENCE {
    redirectedCarrierInfo-v1550
                                            RedirectedCarrierInfo-NB-v1550 OPTIONAL, -- Cond
Redirection-TDD
                                             SEQUENCE {}
                                                               OPTIONAL
   nonCriticalExtension
}
ReleaseCause-NB-r13 ::=
                                              ENUMERATED {loadBalancingTAUrequired, other,
                                                           rrc-Suspend, spare1}
RedirectedCarrierInfo-NB-r13::=
                                              CarrierFreq-NB-r13
RedirectedCarrierInfo-NB-v1430 ::=
                                           SEQUENCE {
                                                  ENUMERATED {
   redirectedCarrierOffsetDedicated-r14
                                                       dB1\,,\ dB2\,,\ dB3\,,\ dB4\,,\ dB5\,,\ dB6\,,\ dB8\,,\ dB10\,,
                                                       dB12, dB14, dB16, dB18, dB20, dB22, dB24, dB26},
    t322-r14
                                                   ENUMERATED {
                                                       min5, min10, min20, min30, min60, min120, min180,
                                                       spare1}
}
RedirectedCarrierInfo-NB-v1550::=
                                            CarrierFreq-NB-v1550
-- ASN1STOP
```

#### RRCConnectionRelease-NB field descriptions

drb-ContinueROHC
This field indicates whether to continue or reset the header compression protocol context for the DRBs configured with
the header compression protocol. Presence of the field indicates that the header compression protocol context
continues when UE initiates UP-EDT in the same cell, while absence indicates that the header compression protocol
context is reset.
extendedWaitTime
Value in seconds.
extendedWaitTime-CPdata
Wait time for data transfer using the Control Plane CIoT EPS optimisation. Value in seconds. See TS 24.301 [35].
redirectedCarrierInfo
The redirectedCarrierInfo indicates a carrier frequency (downlink for FDD) and is used to redirect the UE to a NB-IoT
carrier frequency, by means of the cell selection upon leaving RRC_CONNECTED as specified in TS 36.304 [4].
redirectedCarrierOffsetDedicated
Parameter "Qoffsetdedicated _{frequency} " in TS 36.304 [4]. For NB-IoT carrier frequencies, a UE that supports multi-band
cells considers the redirectedCarrierOffsetDedicated to be common for all overlapping bands (i.e. regardless of the
EARFCN that is used).
releaseCause
The <i>releaseCause</i> is used to indicate the reason for releasing the RRC Connection.
E-UTRAN should not set the releaseCause to loadBalancingTAURequired if the extendedWaitTime is present.
t322
Timer T322 as described in clause 7.3. Value minN corresponds to N minutes.

Conditional presence	Explanation
NoExtendedWaitTime	The field is optionally present, Need ON, if the extendedWaitTime is not included;
	otherwise the field is not present.
Redirection	The field is optionally present, Need ON, if redirectedCarrierInfo is included; otherwise the
	field is not present.
Redirection-TDD	The field is optionally present, Need ON, if redirectedCarrierInfo is included in TDD mode.
	Otherwise, the field is not present.
UP-EDT	The field is optionally present, Need ON, if the UE supports UP-EDT and releaseCause is
	set to <i>rrc-Suspend</i> ; otherwise the field is not present.

## RRCConnectionRequest-NB

The RRCConnectionRequest-NB message is used to request the establishment of an RRC connection.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

#### RRCConnectionRequest-NB message

```
RRCConnectionRequest-NB ::=
```

-- ASN1START

```
criticalExtensions
                                      CHOICE {
       rrcConnectionRequest-r13
                                           RRCConnectionRequest-NB-r13-IEs,
       criticalExtensionsFuture
                                           SEQUENCE { }
   }
}
RRCConnectionRequest-NB-r13-IEs ::= SEQUENCE {
   ue-Identity-r13
                                          InitialUE-Identity,
   establishmentCause-r13
                                          EstablishmentCause-NB-r13,
                                          ENUMERATED {true}
   multiToneSupport-r13
                                                                          OPTIONAL,
   multiCarrierSupport-r13
                                          ENUMERATED {true}
                                                                          OPTIONAL.
                                        BOOLEAN,
   earlyContentionResolution-r14
                                           CQI-NPDCCH-NB-r14,
   cqi-NPDCCH-r14
                                           BIT STRING (SIZE (17))
   spare
}
-- ASN1STOP
```

SEQUENCE {

#### RRCConnectionRequest-NB field descriptions

earlyContentionResolution Value TRUE indicates UE supports MAC PDU containing the UE contention resolution identity MAC control element without RRC response message. This field is always set to TRUE in this version of the specification. establishmentCause Provides the establishment cause for the RRC connection request as provided by the upper layers. eNB is not expected to reject a RRCConnectionRequest due to unknown cause value being used by the UE. multiCarrierSupport If present, this field indicates that the UE supports multi-carrier operation in the mode, FDD or TDD, used for access. multiToneSupport If present, this field indicates that the UE supports UL multi-tone transmissions on NPUSCH in the mode, FDD or TDD, used for access. ue-Identity

UE identity included to facilitate contention resolution by lower layers.

#### RRCConnectionResume-NB

The RRCConnectionResume-NB message is used to resume the suspended RRC connection.

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: E-UTRAN to UE

#### RRCConnectionResume-NB message

RRCConnectionResume-NB ::= RRC-TransactionIdentifier, CHOJCE / rrc-TransactionIdentifier criticalExtensions c1 CHOICE { rrcConnectionResume-r13 RRCConnectionResume-NB-r13-IEs, sparel NULL }, criticalExtensionsFuture SEQUENCE { } } } radioResourceConfigDedicated-r13 RadioR RRCConnectionResume-NB-r13-IEs ::= RadioResourceConfigDedicated-NB-r13 OPTIONAL, Need ON nextHopChainingCount-r13 NextHopChainingCount, ENUMERATED {true} drb-ContinueROHC-r13 OPTIONAL, -- Need OP lateNonCriticalExtension OCTET STRING OPTIONAL, nonCriticalExtension SEQUENCE { } OPTIONAL } -- ASN1STOP

#### RRCConnectionResume-NB field descriptions

This field indicates whether to continue or reset the header compression protocol context for the DRBs configured with the header compression protocol. Presence of the field indicates that the header compression protocol context continues while absence indicates that the header compression protocol context is reset.

## RRCConnectionResumeComplete-NB

The *RRCConnectionResumeComplete-NB* message is used to confirm the successful completion of an RRC connection resumption

Signalling radio bearer: SRB1

RLC-SAP: AM

-- ASN1START

drb-ContinueROHC

Logical channel: DCCH

Direction: UE to E-UTRAN

## RRCConnectionResumeComplete-NB message

```
RRCConnectionResumeComplete-NB ::= SEQUENCE {
   rrc-TransactionIdentifier RRC-TransactionIdentifier,
                                          CHOICE {
   criticalExtensions
       rrcConnectionResumeComplete-r13
                                              RRCConnectionResumeComplete-NB-r13-IEs,
       criticalExtensionsFuture
                                                 SEQUENCE { }
   }
}
RRCConnectionResumeComplete-NB-r13-IEs ::= SEQUENCE {
   selectedPLMN-Identity-r13
                                             INTEGER (1..maxPLMN-r11)
                                                                         OPTIONAL,
   dedicatedInfoNAS-r13
                                              DedicatedInfoNAS OPTIONAL,
                                                                             OPTIONAL.
   lateNonCriticalExtension
                                              OCTET STRING
   nonCriticalExtension
                                              RRCConnectionResumeComplete-NB-v1470-IEs
                                                                                        OPTIONAL
```

}			
RRCConnectionResumeComplete-NB-v1470-IEs ::= SEQUENCE {			
measResultServCell-r14	MeasResultServCell-NB-r14	OPTIONAL,	
nonCriticalExtension	SEQUENCE { }	OPTIONAL	
}			
,			
ASN1STOP			

## RRCConnectionResumeComplete-NB field descriptions

 measResultServCell

 This field refers to the last idle mode measurement results taken of the serving cell.

 selectedPLMN-Identity

 Index of the PLMN selected by the UE from the plmn-IdentityList included in SystemInformationBlockType1-NB. 1 if the 1st PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the plmn-IdentityList included in SIB1-NB, 2 if the 2nd PLMN is selected from the

## RRCConnectionResumeRequest-NB

The *RRCConnectionResumeRequest-NB* message is used to request the resumption of a suspended RRC connection or to perform UP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

#### RRCConnectionResumeRequest-NB message

```
-- ASN1START
RRCConnectionResumeRequest-NB ::= SEQUENCE {
                                      CHOICE {
   criticalExtensions
       rrcConnectionResumeRequest-r13
                                               RRCConnectionResumeRequest-NB-r13-IEs,
       criticalExtensionsFuture
                                               SEQUENCE { }
    }
}
RRCConnectionResumeRequest-NB-r13-IEs ::= SEQUENCE {
                                               ResumeIdentity-r13,
   resumeID-r13
    shortResumeMAC-I-r13
                                               ShortMAC-I,
    resumeCause-r13
                                               EstablishmentCause-NB-r13,
    earlyContentionResolution-r14
                                               BOOLEAN,
                                               COI-NPDCCH-NB-r14,
    cqi-NPDCCH-r14
    spare
                                               BIT STRING (SIZE (4))
}
```

-- ASN1STOP

#### RRCConnectionResumeRequest-NB field descriptions

#### earlyContentionResolution

Value TRUE indicates UE supports MAC PDU containing the UE contention resolution identity MAC control element without RRC response message. This field is always set to TRUE in this version of the specification. **resumeCause** Provides the resume cause for the RRC connection resume request as provided by the upper layers. eNB is not expected to reject a *RRCConnectionResumeRequest* due to unknown cause value being used by the UE. **resumeID** UE identity to facilitate UE context retrieval at eNB. **shortResumeMAC-I** Authentication token to facilitate UE authentication at eNB.

## RRCConnectionSetup-NB

The RRCConnectionSetup-NB message is used to establish SRB1 and SRB1bis.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: E-UTRAN to UE

#### RRCConnectionSetup-NB message

```
-- ASN1START
```

```
RRCConnectionSetup-NB ::=
                               SEOUENCE {
                              RRC-TransactionIdentifier,
   rrc-TransactionIdentifier
   criticalExtensions
                                      CHOICE {
       c1
                                          CHOICE {
           rrcConnectionSetup-r13
                                              RRCConnectionSetup-NB-r13-IEs,
           sparel NULL
       },
       criticalExtensionsFuture
                                          SEQUENCE { }
   }
}
RRCConnectionSetup-NB-r13-IEs ::=
                                      SEQUENCE {
   radioResourceConfigDedicated-r13
                                         RadioResourceConfigDedicated-NB-r13,
   lateNonCriticalExtension
                                                                             OPTIONAL,
                                          OCTET STRING
   nonCriticalExtension
                                          SEQUENCE { }
                                                                             OPTIONAL
}
-- ASN1STOP
```

## RRCConnectionSetupComplete-NB

The *RRCConnectionSetupComplete-NB* message is used to confirm the successful completion of an RRC connection establishment.

Signalling radio bearer: SRB1bis

RLC-SAP: AM

-- ASN1START

Logical channel: DCCH

Direction: UE to E-UTRAN

#### RRCConnectionSetupComplete-NB message

```
RRCConnectionSetupComplete-NB ::= SEQUENCE {
                                  RRC-TransactionIdentifier,
   rrc-TransactionIdentifier
   criticalExtensions
                                          CHOICE {
          rrcConnectionSetupComplete-r13
                                              RRCConnectionSetupComplete-NB-r13-IEs,
                                              SEQUENCE { }
           criticalExtensionsFuture
   }
}
RRCConnectionSetupComplete-NB-r13-IEs ::= SEQUENCE {
   selectedPLMN-Identity-r13
                                          INTEGER (1..maxPLMN-r11),
   s-TMSI-r13
                                          S-TMSI
                                                                         OPTIONAL,
   registeredMME-r13
                                         RegisteredMME
                                                                         OPTIONAL,
   dedicatedInfoNAS-r13
                                          DedicatedInfoNAS.
   attachWithoutPDN-Connectivity-r13
                                          ENUMERATED {true}
                                                                         OPTIONAL,
   up-CIoT-EPS-Optimisation-r13
                                         ENUMERATED {true}
                                                                         OPTIONAL,
   lateNonCriticalExtension
                                          OCTET STRING
                                                                         OPTIONAL,
   nonCriticalExtension
                                          RRCConnectionSetupComplete-NB-v1430-IEs OPTIONAL
}
```

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```
RRCConnectionSetupComplete-NB-v1430-IEs ::= SEQUENCE {
    gummei-Type-r14
                                            ENUMERATED { mapped}
                                                                    OPTIONAL,
    dcn-ID-r14
                                            INTEGER (0..65535)
                                                                        OPTIONAL,
                                            RRCConnectionSetupComplete-NB-v1470-IEs OPTIONAL
   nonCriticalExtension
}
RRCConnectionSetupComplete-NB-v1470-IEs ::= SEQUENCE {
                                                MeasResultServCell-NB-r14 OPTIONAL,
    measResultServCell-r14
   nonCriticalExtension
                                                SEQUENCE { }
                                                                            OPTIONAL
}
```

-- ASN1STOP

#### RRCConnectionSetupComplete-NB field descriptions attachWithoutPDN-Connectivity This field is used to indicate that the UE performs an Attach without PDN connectivity procedure, as indicated by the upper layers, TS 24.301 [35]. dcn-ID The Dedicated Core Network Identity, see TS 23.401 [41]. gummei-Type This field is used to indicate that the GUMMEI included is mapped (from 2G/3G identifiers) as indicated by the upper layers, TS 24.301 [35]. measResultServCell This field refers to the last idle mode measurement results taken of the serving cell. registeredMME This field is used to transfer the GUMMEI of the MME where the UE is registered, as provided by upper layers. selectedPLMN-Identity Index of the PLMN selected by the UE from the plmn-IdentityList included in SystemInformationBlockType1-NB. 1 if the 1st PLMN is selected from the *plmn-IdentityList* included in SIB1, 2 if the 2nd PLMN is selected from the *plmn-*IdentityList included in SIB1 and so on. up-CloT-EPS-Optimisation This field is included when the UE supports S1-U data transfer or the User plane CIoT EPS Optimisation, as indicated by the upper layers, see TS 24.301 [35].

## RRCEarlyDataComplete-NB

The RRCEarlyDataComplete-NB message is used to confirm the successful completion of the CP-EDT procedure.

Signalling radio bearer: SRB0

RLC-SAP: TM

-- ASN1START

Logical channel: CCCH

Direction: E-UTRAN to UE

#### RRCEarlyDataComplete-NB message

<pre>RRCEarlyDataComplete-NB-r15 ::=     criticalExtensions         rrcEarlyDataComplete-r15         criticalExtensionsFuture     } }</pre>	SEQUENCE { CHOICE { RRCEarlyDataComplete-NB-r15 SEQUENCE {}	-IEs,	
<pre>RRCEarlyDataComplete-NB-r15-IEs ::=     dedicatedInfoNAS-r15     extendedWaitTime-r15     redirectedCarrierInfo-r15     redirectedCarrierInfoExt-r15 Redirection     nonCriticalExtension }</pre>	<pre>SEQUENCE {    DedicatedInfoNAS    INTEGER (11800)    RedirectedCarrierInfo-NB-r13    RedirectedCarrierInfo-NB-v1430    SEQUENCE {}</pre>	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need ON Need ON Cond

-- ASN1STOP

RRCEarlyDataComplete-NB field descriptions		
extendedWaitTime		
Value in seconds.		

Conditional presence	Explanation	
Redirection	The field is optionally present, Need ON, if <i>redirectedCarrierInfo</i> is included; otherwise the	
	field is not present.	

## RRCEarlyDataRequest-NB

The RRCEarlyDataRequest-NB message is used to initiate CP-EDT.

Signalling radio bearer: SRB0

RLC-SAP: TM

Logical channel: CCCH

Direction: UE to E-UTRAN

#### RRCEarlyDataRequest-NB message

```
-- ASN1START

RRCEarlyDataRequest-NB-r15 ::= SEQUENCE {

criticalExtensions CHOICE {

rrcEarlyDataRequest-r15 RRCEarlyDataRequest-NB-r15-IEs,

criticalExtensionsFuture SEQUENCE {

}

}

RRCEarlyDataRequest-NB-r15-IEs ::= SEQUENCE {

s-TMSI-r15 S-TMSI,

establishmentCause-r15 ENUMERATED {mo-Data-r15, mo-ExceptionData-r15,

cqi-NPDCCH-r15 CQI-NPDCCH-nB-r14 OPTIONAL,

dedicatedInfoNAS-r15 DedicatedInfoNAS,

nonCriticalExtension SEQUENCE {}

CQI-NPDCCE {}

CQI-NPDCCH-RB-r14 OPTIONAL,

DedicatedInfoNAS,

NOPTIONAL }

}
```

-- ASN1STOP

#### RRCEarlyDataRequest-NB field descriptions

establishmentCause Provides the establishment cause for the RRC early data request as provided by the upper layers. eNB is not expected to reject a *RRCEarlyDataRequest* due to unknown cause value being used by the UE.

## SCPTMConfiguration-NB

The *SCPTMConfiguration-NB* message contains the control information applicable for MBMS services transmitted via SC-MRB.

Signalling radio bearer: N/A

RLC-SAP: UM

Logical channel: SC-MCCH

Direction: E-UTRAN to UE

#### SCPTMConfiguration-NB message

```
-- ASN1START
```

SCPTMConfiguration-NB-r14 ::= SEQUENCE {

	sc-mtch-InfoList-r14 scptm-NeighbourCellList-r14 lateNonCriticalExtension nonCriticalExtension	SC-MTCH-InfoList-NB-r14, SCPTM-NeighbourCellList-NB-r14 OCTET STRING SEQUENCE {}	OPTIONAL, Need OP OPTIONAL, OPTIONAL
}			

```
-- ASN1STOP
```

#### SCPTMConfiguration-NB field descriptions

sc-mtch-InfoList Provides the configuration of each SC-MTCH in the current cell. scptm-NeighbourCellList List of neighbour cells providing MBMS services via SC-MRB. When absent, the UE shall assume that MBMS services listed in the SCPTMConfiguration-NB message are not provided via SC-MRB in any neighbour cell.

## SystemInformation-NB

The *SystemInformation-NB* message is used to convey one or more System Information Blocks. All the SIBs included are transmitted with the same periodicity.

Signalling radio bearer: N/A

RLC-SAP: TM

Logical channel: BCCH

Direction: E-UTRAN to UE

#### SystemInformation-NB message

```
-- ASN1START
```

```
SystemInformation-NB ::=
                               SEOUENCE {
       systemInformation-r13 CHOICE {
    criticalExtensions
                                           SystemInformation-NB-r13-IEs,
                                           SEQUENCE { }
       criticalExtensionsFuture
    }
SystemInformation-NB-r13-IEs ::= SEQUENCE {
   sib-TypeAndInfo-r13
                                   SEQUENCE (SIZE (1..maxSIB)) OF CHOICE {
                                           SystemInformationBlockType2-NB-r13,
       sib2-r13
       sib3-r13
                                           SystemInformationBlockType3-NB-r13,
       sib4-r13
                                           SystemInformationBlockType4-NB-r13,
       sib5-r13
                                           SystemInformationBlockType5-NB-r13,
                                           SystemInformationBlockType14-NB-r13,
       sib14-r13
       sib16-r13
                                           SystemInformationBlockType16-NB-r13,
        sib15-v1430
                                           SystemInformationBlockType15-NB-r14,
        sib20-v1430
                                           SystemInformationBlockType20-NB-r14,
       sib22-v1430
                                           SystemInformationBlockType22-NB-r14,
       sib23-v1530
                                           SystemInformationBlockType23-NB-r15
    lateNonCriticalExtension
                                      OCTET STRING
                                                                          OPTIONAL,
    nonCriticalExtension
                                       SEQUENCE { }
                                                                           OPTIONAL
}
```

```
-- ASN1STOP
```

## SystemInformationBlockType1-NB

The *SystemInformationBlockType1-NB* message contains information relevant when evaluating if a UE is allowed to access a cell and defines the scheduling of other system information.

Signalling radio bearer: N/A

RLC-SAP: TM

-- ASN1START

Logical channel: BCCH

Direction: E-UTRAN to UE

#### SystemInformationBlockType1-NB message

```
nyperSFN-MSB-r13

cellAccessRelatedInfo-r13

plmn-IdentityList-r13

trackingAreaCode-r13

cellBarred-r13

biggueNCE {

BIT STRING (SIZE (8)),

SEQUENCE {

PLMN-IdentityList-NB-r13,

TrackingAreaCode,

CellIdentity,

ENUMPERATION
SystemInformationBlockType1-NB ::= SEQUENCE {
                                                   ENUMERATED {barred, notBarred},
ENUMERATED {allowed, notAllowed}
         intraFreqReselection-r13
    },
    cellSelectionInfo-r13
q-RxLevMin-r13
q-QualMin-r13
                                             SEQUENCE {
                                              Q-RxLevMin,
   q-QualMin-r13
                                                    Q-QualMin-r9
                                                             dBldot23, dB2, dB3,
dB4, dB4dot23, dB5,
dB6, dB7, dB8,
dB9} OPTIONAL, -- Cond inband-SamePCI
    schedulingInfoList-r13SchedulingInfoList-NB-r13,si-WindowLength-r13ENUMERATED {ms160, ms320, ms480, ms640,
    si-RadioFrameOffset-r13 INTEGER (1..15) OPTIONAL, -- Need OP
systemInfoValueTagList-r13 SystemInfoValueTagList-NB-r13 OPTIONAL,
lateNonCriticalExtension OCTET STRING OPTIONAL
NonCriticalExtension SystemInformational
                                                                                                  -- Need OR
                                              SystemInformationBlockType1-NB-v1350 OPTIONAL
}
SystemInformationBlockType1-NB-v1350 ::= SEQUENCE {
    cellSelectionInfo-v1350CellSelectionInfo-NB-v1350OPTIONAL,-- Cond QrxlevminnonCriticalExtensionSystemInformationBlockTypel-NB-v1430OPTIONAL
    nonCriticalExtension
}
SystemInformationBlockType1-NB-v1430 ::= SEQUENCE {
    cellselectionInfo-v1430CellselectionInfo-NB-v1430OPTICnonCriticalExtensionSystemInformationBlockTypel-NB-v1450
                                                                                OPTIONAL,
                                                                                                    -- Need OR
    OPTIONAL
}
SystemInformationBlockType1-NB-v1450 ::= SEQUENCE {
    nrs-CRS-PowerOffset-v1450
                                                    ENUMERATED {dB-6, dB-4dot77, dB-3,
                                                              dB-1dot77, dB0, dB1, dB1, dB1
                                                              dBldot23, dB2,
                                                                                        dB3,
                                                              dB4,
                                                                          dB4dot23, dB5,
                                                                                       dB8,
                                                              dB6,
                                                                          dB7,
                                                                            OPTIONAL, -- Cond inband-SamePCI-
                                                              dB9}
ExceptAnchor
    nonCriticalExtension
                                              SystemInformationBlockType1-NB-v1530
    OPTIONAL
}
SystemInformationBlockType1-NB-v1530 ::= SEQUENCE {
                               SEQUENCE {
    tdd-Parameters-r15
         tdd-Config-r15
                                                        TDD-Config-NB-r15,
         tdd-SI-CarrierInfo-r15
                                                         ENUMERATED {anchor, non-anchor},
         tdd-SI-SubframesBitmap-r15
                                                         DL-Bitmap-NB-r13 OPTIONAL
                                                                                                    -- Cond TDD-SI-
NonAnchor
    } OPTIONAL, -- Cond TDD
                                   SchedulingInfoList-NB-v1530 OPTIONAL, -- Need OR
   schedulingInfoList-v1530
```

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nonCriticalExtension SEQUENCE { } OPTIONAL } PLMN-IdentityList-NB-r13 ::= SEQUENCE (SIZE (1..maxPLMN-r11)) OF PLMN-IdentityInfo-NB-r13 PLMN-IdentityInfo-NB-r13 ::= SEQUENCE { PLMN-Identity, plmn-Identity-r13 cellReservedForOperatorUse-r13 ENUMERATED {reserved, notReserved}, attachWithoutPDN-Connectivity-r13 ENUMERATED {true} OPTIONAL -- Need OP } SchedulingInfoList-NB-r13 ::= SEQUENCE (SIZE (1..maxSI-Message-NB-r13)) OF SchedulingInfo-NB-r13 SchedulingInfoList-NB-v1530 ::= SEQUENCE (SIZE (1..maxSI-Message-NB-r13)) OF SchedulingInfo-NB-v1530 SchedulingInfo-NB-r13::= SEQUENCE { si-Periodicity-r13 ENUMERATED {rf64, rf128, rf256, rf512, rf1024, rf2048, rf4096, spare}, ENUMERATED {every2ndRF, every4thRF, every8thRF, every16thRF}, si-RepetitionPattern-r13 sib-MappingInfo-r13 SIB-MappingInfo-NB-r13, ENUMERATED {b56, b120, b208, b256, b328, b440, b552, b680} si-TB-r13 } SchedulingInfo-NB-v1530::= SEQUENCE { sib-MappingInfo-v1530 SIB-MappingInfo-NB-v1530 OPTIONAL -- Need OR } SystemInfoValueTagList-NB-r13 ::= SEQUENCE (SIZE (1.. maxSI-Message-NB-r13)) OF SystemInfoValueTagSI-r13 SIB-MappingInfo-NB-r13 ::= SEQUENCE (SIZE (0..maxSIB-1)) OF SIB-Type-NB-r13 SIB-MappingInfo-NB-v1530 ::= SEQUENCE (SIZE (1..8)) OF SIB-Type-NB-v1530 ENUMERATED { SIB-Type-NB-r13 ::= sibType3-NB-r13, sibType4-NB-r13, sibType5-NB-r13, sibType14-NB-r13, sibType16-NB-r13, sibType15-NB-r14, sibType20-NB-r14, sibType22-NB-r14} SIB-Type-NB-v1530 ::= ENUMERATED { sibType23-NB-r15, spare7, spare6, spare5, spare4, spare3, spare2, spare1} CellSelectionInfo-NB-v1350 ::= SEQUENCE { delta-RxLevMin-v1350 INTEGER (-8..-1) } CellSelectionInfo-NB-v1430 ::= SEQUENCE { powerClass14dBm-Offset-r14 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12} OPTIONAL, --Need OP ce-authorisationOffset-r14 ENUMERATED {dB5, dB10, dB15, dB20, dB25, dB30, dB35} OPTIONAL -- Need OP }

-- ASN1STOP

	SystemInformationBlockType1-NB field descriptions
attachWithoutPDN-C	
	icates that attach without PDN connectivity as specified in TS 24.301 [35] is supported for this
⊃LMN. c <b>e-authorisationOffs</b>	of
	er _{orization} " in TS 36.304 [4]. Value in dB. Value dB5 corresponds to 5 dB, dB10 corresponds to 10
B and so on.	
	e value of 0 dB shall be used for "Qoffset _{authorization} ".
cellBarred	le value of o ub shall be used for Gonsetauthorization.
	is barred, as defined in TS 36.304 [4].
cellidentity	
ndicates the cell ident	itv
cellReservedForOpe	
As defined in TS 36.30	
cellSelectionInfo	[ד] די].
	ion as specified in TS 36.304 [4].
downlinkBitmap	
	nlink subframe configuration for downlink transmission as specified in TS 36.213 [23], clause
For TDD, NB-IoT down specified in TS 36.213	nlink, uplink and special subframes configuration for transmission on the anchor carrier as [23], clause 16.4. If the bitmap is not present, the UE shall assume that all subframes are valic carrying NPSS/NSSS/NPBCH/SIB1-NB) as specified in TS 36.213 [23], clause 16.4.
eutraControlRegionS	
	egion size of the E-UTRA cell for the in-band operation mode, see TS 36.213 [23]. Unit is in
number of OFDM sym	
freqBandInfo	
A list of additionalPma	x and additionalSpectrumEmission values as defined in TS 36.101 [42], clause 6.2.4F for the
requency band in freq	
hyperSFN-MSB	
ndicates the 8 most si	gnificant bits of hyper-SFN. Together with hyperSFN-LSB in MIB-NB, the complete hyper-SFN
	is incremented by one when the SFN wraps around.
intraFreqReselection	
	selection to intra-frequency cells when the highest ranked cell is barred, or treated as barred b
he UE, as specified in	TS 36.304 [4].
multiBandInfoList	
TS 36.101 [42], table strength frequency band. Other	uency band indicators, <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values, as defined in 5.5-1. If the UE supports the frequency band in the <i>freqBandIndicator</i> IE it shall apply that wise, the UE shall apply the first listed band which it supports in the <i>multiBandInfoList</i> IE.
nrs-CRS-PowerOffse	•
	veen NRS and E-UTRA CRS, see TS 36.213 [23], clause 16.2.2. Unit in dB. Default value of 0
plmn-IdentityList	
	. The first listed <i>PLMN-Identity</i> is the primary PLMN.
powerClass14dBm-C	
	TS 36.304 [4]. Only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value
	6 dB, dB-3 corresponds to -3 dB and so on. If the fied is absent, the UE applies the (default)
value of 0 dB for "Poffs	set" in TS 36.304 [4].
p-Max	
<u></u>	e cell. If absent the UE applies the maximum power according to the UE capability.
q-QualMin	
Parameter "Q _{qualmin} " in	
q-RxLevMin, delta-R	
	S 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm].
	uded, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm].
schedulingInfoList	
	heduling information of SI messages.
si-Periodicity	
-	essage in radio frames, such that rf256 denotes 256 radio frames, rf512 denotes 512 radio
rames, and so on.	
si-RadioFrameOffset	
	dio frames to calculate the start of the SI window.
f the field is absent, no	o ottset is applied.
si-RepetitionPattern	
corresponds to every 2	adio frames within the SI window used for SI message transmission. Value every2ndRF 2 radio frames, value every4thRF corresponds to every 4 radio frames and so on. The first message is transmitted from the first radio frame of the SI window.

	SystemInformationBlockType1-NB field descriptions	
si-TB		
This field indicates the transport block size in number of bits and the corresponding number of consecutive NB-IoT		
downlink subframes that are used to broadcast the SI message. Value b56 corresponds to 56 bits, b120 corresponds		
to 120 bits and so on. TBS	of 56 bits and 120 bits are transmitted over 2 sub-frames, other TBS are transmitted over 8	
sub-frames, see TS 36.213	[23], Table 16.4.1.5.1-1.	
si-WindowLength		
Common SI scheduling win	dow for all SIs. Unit in milliseconds, where ms160 denotes 160 milliseconds, ms320	
denotes 320 milliseconds a	nd so on.	
sib-MappingInfo		
List of the SIBs mapped to	this SystemInformation message. There is no mapping information of SIB2-NB; it is always	
present in the first Systemli	nformation message listed in the schedulingInfoList list.	
systemInfoValueTagList		
Indicates SI message speci	fic value tags. It includes the same number of entries, and listed in the same order, as in	
SchedulingInfoList.		
systemInfoValueTagSI		
SI message specific value t	ag as specified in Clause 5.2.1.3. Common for all SIBs within the SI message other than	
SIB14-NB.		
tdd-Config		
Indicates the the TDD spec	ific physical channel configuration.	
tdd-SI-CarrierInfo		
Carrier used for SI message	e transmission. Value anchor corresponds to anchor carrier, value non-anchor corresponds	
to non-anchor carrier. See	FS 36.213 [23].	
	to value non-anchor then sib-GuardbandInfo in MIB-TDD-NB (in case of	
	guardband) or sib-InbandLocation in MIB-TDD-NB (in case of operationmodeInfo is set to	
inband-SamePCI or inband	-DifferentPCI) or sib-StandaloneLocation in MIB-TDD-NB (in case of operationmodeInfo is	
set to standalone) defines v	which non-anchor carrier is used (see MIB-NB-TDD).	
tdd-SI-SubframesBitmap		
NB-IoT downlink, uplink and	d special subframes configuration for transmission on the carrier carrying the SI message	
as specified in TS 36.213 [2	23], clause 16.4.	
trackingAreaCode		
A trackingAreaCode that is	common for all the PLMNs listed.	
Conditional presence	Explanation	

Conditional presence	Explanation	
inband	In FDD: The field is mandatory present if IE operationModeInfo in MIB-NB is set to	
	inband-SamePCI or inband-DifferentPCI. Otherwise the field is not present.	
	In TDD: The field is mandatory present if:	
	- IE operationModeInfo in MIB-TDD-NB is set to inband-SamePCI or inband-DifferentPCI	
	or	
	- IE operationModeInfo in MIB-TDD-NB is set to guardband and IE sib-GuardbandInfo in	
	MIB-TDD-NB is set to <i>sib-GuardbandInbandSamePCI</i> or <i>sib-GuardbandinbandDiffPCI</i> and IE <i>tdd-SI-CarrierInfo</i> is set to non-anchor	
inband-SamePCI The field is mandatory present, if IE operationModeInfo in MIB-NB is set to inb		
	SamePCI. Otherwise the field is not present.	
inband-SamePCI-	The field is optionally present if IE operationModeInfo in MIB-NB is set to a value other	
ExceptAnchor	than inband-SamePCI, and at least one non-anchor carrier is inband carrier and uses the	
	same PCI as the E-UTRA carrier. Otherwise the field is not present.	
<i>Qrxlevmin</i> This field is optionally present, Need OR, if <i>q-RxLevMin</i> is set to the minimum val		
	Otherwise the field is not present.	
SIB1 The field is mandatory present if IE additionalTransmissionSIB1 in MIB-NB is set		
	TRUE. Otherwise the field is optionally present, Need OP.	
TDD	The field is mandatory present for TDD; otherwise the field is not present and the UE shall	
	delete any existing value for this field.	
TDD-SI-NonAnchor	The field is mandatory present for TDD if <i>si-CarrierInfo</i> is set to <i>non-anchor</i> , otherwise the	
	field is not present and the UE shall delete any existing value for this field.	

# UECapabilityEnquiry-NB

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The UECapabilityEnquiry-NB message is used to request the transfer of UE radio access capabilities for NB-IoT.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: E-UTRAN to UE

### UECapabilityEnquiry-NB message

```
-- ASN1START
UECapabilityEnquiry-NB ::= SEQUENCE {
   rrc-TransactionIdentifier
                                     RRC-TransactionIdentifier,
   criticalExtensions
                                    CHOICE {
           ueCapabilityEnquiry-r13 UECap
sparel
       c1
                                            UECapabilityEnquiry-NB-r13-IEs,
       },
                               SEQUENCE { }
       criticalExtensionsFuture
   }
}
UECapabilityEnquiry-NB-r13-IEs ::= SEQUENCE {
   lateNonCriticalExtension OCTET STRING
                                                                      OPTIONAL,
   nonCriticalExtension
                                    SEQUENCE { }
                                                                      OPTIONAL
}
```

-- ASN1STOP

## UECapabilityInformation-NB

The *UECapabilityInformation-NB* message is used to transfer of UE radio access capabilities requested by the E-UTRAN.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

## UECapabilityInformation-NB message

```
-- ASN1START
UECapabilityInformation-NB ::= SEQUENCE {
   rrc-TransactionIdentifier RRC-TransactionIdentifier,
                                     CHOICE {
   criticalExtensions
           ueCapabilityInformation-r13 UECapabilityInformation-NB-r13-IEs,
           criticalExtensionsFuture
                                         SEQUENCE { }
   }
}
UECapabilityInformation-NB-r13-IEs ::= SEQUENCE {
   ue-RadioPagingInfo-r13
                                         UE-Capability-NB-r13,
                                         UE-RadioPagingInfo-NB-r13,
   lateNonCriticalExtension
                                         OCTET STRING
                                                                           OPTIONAL.
   nonCriticalExtension
                                         UECapabilityInformation-NB-Ext-r14-IEs
       OPTIONAL
}
UECapabilityInformation-NB-Ext-r14-IEs ::= SEQUENCE {
   ue-Capability-ContainerExt-r14
                                         OCTET STRING (CONTAINING UE-Capability-NB-Ext-r14-IEs),
   nonCriticalExtension
                                         SEQUENCE { }
                                                                            OPTIONAL
}
-- ASN1STOP
```

ue-RadioPagingInfo

```
UECapabilityInformation-NB field descriptions
```

This field contains UE capability information used for paging.

## ULInformationTransfer-NB

The ULInformationTransfer-NB message is used for the uplink transfer of NAS information.

Signalling radio bearer: SRB1 or SRB1bis

RLC-SAP: AM

Logical channel: DCCH

Direction: UE to E-UTRAN

### ULInformationTransfer-NB message

```
-- ASN1START
ULInformationTransfer-NB ::=
                                SEQUENCE {
                                        CHOICE {
    criticalExtensions
           ulInformationTransfer-r13
                                            ULInformationTransfer-NB-r13-IEs,
           criticalExtensionsFuture
                                            SEQUENCE { }
    }
}
ULInformationTransfer-NB-r13-IEs ::=
                                        SEQUENCE {
   dedicatedInfoNAS-r13
                                           DedicatedInfoNAS,
    lateNonCriticalExtension
                                            OCTET STRING
                                                                             OPTIONAL.
    nonCriticalExtension
                                            SEQUENCE { }
                                                                             OPTIONAL
}
-- ASN1STOP
```

# 6.7.3 NB-IoT information elements

## 6.7.3.1 NB-IoT System information blocks

### SystemInformationBlockType2-NB

The IE *SystemInformationBlockType2-NB* contains radio resource configuration information that is common for all UEs.

NOTE: UE timers and constants related to functionality for which parameters are provided in another SIB are included in the corresponding SIB.

### SystemInformationBlockType2-NB information element

```
-- ASN1START
SystemInformationBlockType2-NB-r13 ::= SEQUENCE {
    radioResourceConfigCommon-r13
ue-TimersAndConstants-r13
freqInfo-r13
RadioResourceConfigCommonSIB-NB-r13,
SEQUENCE {
SEQUENCE {
        ul-CarrierFreq-r13
                                                    CarrierFreq-NB-r13
                                                                                   OPTIONAL,
                                                                                                -- Need OP
        additionalSpectrumEmission-r13
                                                    AdditionalSpectrumEmission
    },
    timeAlignmentTimerCommon-r13
                                               TimeAlignmentTimer,
    multiBandInfoList-r13 SEQUENCE (SIZE (1..maxMultiBands)) OF AdditionalSpectrumEmission
    OPTIONAL,
                 -- Need OR
                                                OCTET STRING
    lateNonCriticalExtension
                                                                                   OPTIONAL.
       cp-Reestablishment-r14
                                                ENUMERATED {true}
                                                                                   OPTIONAL
    11
                                                                                                     -- Need
OP
    11,
```

	]]	servingCellMeasInfo-r14	ENUMERATED {true}	OPTIONAL, Need
OR	ιι	Servingcerimeasinio 114	ENGMERATED (CIUE)	OFTIONAL, Need
OR		cqi-Reporting-r14	ENUMERATED {true}	OPTIONAL Need
OR		cdi veboi ciud ili	ENGMERATED (CIUE)	OFTIONAL Need
OR	11			
	]],			
	[[	enhancedPHR-r15	ENUMERATED {true}	OPTIONAL, Need OR
		freqInfo-v1530	SEQUENCE {	
		tdd-UL-DL-AlignmentOffset-r15	TDD-UL-DL-Alignment	Offset-NB-r15
		} OPTIONAL, Cond TDD		
		cp-EDT-r15	ENUMERATED {true}	OPTIONAL, Need OR
		up-EDT-r15	ENUMERATED {true}	OPTIONAL Need OR
	11	GF 201 110		
	11			
}				

```
-- ASN1STOP
```

-- ASN1START

	SystemInformationBlockType2-NB field descriptions
additionalSpectrumEmiss	ion
The UE requirements relate	d to IE AdditionalSpectrumEmission are defined in TS 36.101 [42], clause 6.2.4F.
cp-EDT	
For FDD: This field indicates	s whether the UE is allowed to initiate CP-EDT, see 5.3.3.1b.
cp-Reestablishment	
This field indicates if the NB	-loT UE is allowed to trigger RRC connection re-establishment when AS security has not
been activated.	
cqi-Reporting	
For FDD: This field indicates	s if downlink channel quality reporting in RRCConnectionReestablishmentRequest-NB,
RRCConnectionRequest-N	B and RRCConnectionResumeRequest-NB message is allowed.
enhancedPHR	
For FDD: This field indicates	s if the NB-IoT UE is allowed to report enhanced PHR in MSG3 as specified in TS 36.321
[6].	
multiBandInfoList	
A list of additionalSpectrum	Emission i.e. one for each additional frequency band included in multiBandInfoList in
SystemInformationBlockTyp	be1-NB, listed in the same order.
servingCellMeasInfo	
This field indicates if serving	cell idle mode measurement reporting in RRCConnectionReestablishmentComplete-NB,
RRCConnectionResumeCo	mplete-NB and RRCConnectionSetupComplete-NB is allowed.
tdd-UL-DL-AlignmentOffs	et
Indicates the offset between	the UL carrier frequency center with respect to DL carrier frequency center for the anchor
carrier.	
ul-CarrierFreq	
For FDD: Uplink carrier freq	uency as defined in TS 36.101 [42], clause 5.7.3F. If operationModeInfo in the MIB-NB is
set to standalone and the fie	eld is absent, the value of the carrier frequency is determined by the TX-RX frequency
separation defined in TS 36	.101 [42], table 5.7.4-1, and the value of the carrier frequency offset is 0. If
operationModeInfo in the MI	B-NB is not set to standalone, the field is mandatory present.
For TDD: This field is absen	t and the uplink carrier frequency is same as the downlink frequency.
up-EDT	
For FDD: This field indicates	s whether the UE is allowed to initiate UP-EDT, see 5.3.3.1b.
	Fundamentary
Conditional presence	Explanation

Conditional presence	Explanation
TDD	The field is mandatory present for TDD; otherwise the field is not present and the UE shall
	delete any existing value for this field.

## SystemInformationBlockType3-NB

The IE *SystemInformationBlockType3-NB* contains cell re-selection information common for intra-frequency, and interfrequency cell re-selection as well as intra-frequency cell re-selection information other than neighbouring cell related.

## SystemInformationBlockType3-NB information element

```
SystemInformationBlockType3-NB-r13 ::= SEQUENCE {
cellReselectionInfoCommon-r13 SEQUENCE {
q-Hyst-r13 ENUMERATED {
dB0, dB1, dB2, dB3, dB4, dB5, dB6, dB8, dB10,
dB12, dB14, dB16, dB18, dB20, dB22, dB24
```

<pre>}, cellReselectionServingFreqInfo-r13 SEQUENCE {     s-NonIntraSearch-r13 ReselectionThreshold }, intraFreqCellReselectionInfo-r13 SEQUENCE {</pre>
intraFreqCellReselectionInfo-r13 SEQUENCE {
q-RxLevMin-r13Q-RxLevMin,q-QualMin-r13Q-QualMin-r9OPTIONAL, Need OPp-Max-r13P-MaxOPTIONAL, Need OPs-IntraSearchP-r13ReselectionThreshold, Need OPt-Reselection-r13T-Reselection-NB-r13}, Need OP
freqBandInfo-r13 NS-PmaxList-NB-r13 OPTIONAL, Need OR multiBandInfoList-r13 SEQUENCE (SIZE (1maxMultiBands)) OF NS-PmaxList-NB-r13 OPTIONAL, Need OR lateNonCriticalExtension OCTET STRING OPTIONAL,
, [[ intraFreqCellReselectionInfo-v1350 IntraFreqCellReselectionInfo-NB-v1350 OPTIONAL Cond Qrxlevmin
<pre>]], [[ intraFreqCellReselectionInfo-v1360 IntraFreqCellReselectionInfo-NB-v1360 OPTIONAL Need OR</pre>
]], [[ intraFreqCellReselectionInfo-v1430 IntraFreqCellReselectionInfo-NB-v1430 OPTIONAL Need OR
]], [[ cellReselectionInfoCommon-v1450 CellReselectionInfoCommon-NB-v1450 OPTIONAL Need OR
<pre>]], [[ nsss-RRM-Config-r15 NSSS-RRM-Config-NB-r15 OPTIONAL, Need OR npbch-RRM-Config-r15 ENUMERATED {enabled} OPTIONAL Need OR ]] }</pre>
<pre>IntraFreqCellReselectionInfo-NB-v1350 ::= SEQUENCE {     delta-RxLevMin-v1350 INTEGER (-81) }</pre>
<pre>IntraFreqCellReselectionInfo-NB-v1360 ::= SEQUENCE {     s-IntraSearchP-v1360 ReselectionThreshold-NB-v1360 }</pre>
<pre>IntraFreqCellReselectionInfo-NB-v1430 ::= SEQUENCE {     powerClass14dBm-Offset-r14 ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12} OPTIONAL, Need OP     ce-AuthorisationOffset-r14 ENUMERATED {dB5, dB10, dB15, dB20, dB25, dB30, dB35} OPTIONA     Need OP</pre>
}
CellReselectionInfoCommon-NB-v1450 ::= SEQUENCE { s-SearchDeltaP-r14 ENUMERATED {dB6, dB9, dB12, dB15} }
ASN1STOP

SystemInformationBlockType3-NB field descriptions	
ce-AuthorisationOffset	
Parameter "Qoffset _{authorization} " in TS 36.304 [4]. Value in dB. Value dB5 corresponds to 5 dB, dB10 corresponds t	to 10
dB and so on.	
If the field is absent, the UE applies the value of ce-authorisationOffset in SystemInformationBlockType1-NB.	
multiBandInfoList	
A list of additionalPmax and additionalSpectrumEmission values as defined in TS 36.101 [42], clause 6.2.4F,	
applicable for the intra-frequency neighbouring NB-IoT cells if the UE selects the frequency band from	
freqBandIndicator in SystemInformationBlockType1-NB.	
npbch-RRM-Config	
For FDD: Configuration for NPBCH-based RRM measurements. See TS 36.214 [24].	
If enabled, NPBCH can be used in addition to NRS for RRM measurements for serving cell.	
nsss-RRM-Config	
For FDD: Configuration for NSSS-based RRM measurements for the serving cell.	
powerClass14dBm-Offset	
Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting powerClassNB-14dBm. Value in dB. Val	lue dB
6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default)	
of 0 dB for "Poffset" in TS 36.304 [4].	
p-Max	
Value applicable for the intra-frequency neighbouring E-UTRA cells. If absent the UE applies the maximum pow	er
according to the UE capability.	0.
q-Hyst	
Parameter Q _{hyst} in TS 36.304 [4], Value in dB. Value dB1 corresponds to 1 dB, dB2 corresponds to 2 dB and so	on
q-QualMin	0.11.
Parameter "Q _{qualmin} " in TS 36.304 [4], applicable for intra-frequency neighbour cells. If the field is not present, the	οUF
applies the (default) value of negative infinity for Q _{qualmin} .	
q-RxLevMin, delta-RxLevMin	
Parameter "Q _{rxlevmin} " in TS 36.304 [4], applicable for intra-frequency neighbour cells. If <i>delta-RxLevMin</i> is not inc	hahul
actual value $Q_{rxlevrnin} = q - RxLevMin^* 2 [dBm]$ . If <i>delta-RxLevMin</i> is included, actual value $Q_{rxlevrnin} = (q - RxLevMin)^*$	
delta-RxLevMin) * 2 [dBm].	/ Ŧ
s-IntraSearchP	
Parameter "SintraSearchp" in TS 36.304 [4].	
In case s-IntraSearchP v1360 is included, the UE shall ignore s-IntraSearchP (i.e. without suffix).	
s-NonIntraSearch	
Parameter "SnonIntraSearchP" in TS 36.304 [4].	
s-SearchDeltaP	
Parameter "S _{SearchDeltaP} " in TS 36.304 [4]. This parameter is only applicable for UEs supporting relaxed monitorin	
specified in TS 36.306 [5]. Value dB6 corresponds to 6 dB, dB9 corresponds to 9 dB and so on.	iy as
<i>t-Reselection</i>	
Parameter "Treselection _{NB-loT_Intra} " in TS 36.304 [4].	

Conditional presence	Explanation	
Qrxlevmin	This field is optionally present, Need OR, if <i>q-RxLevMin</i> is set to the minimum value.	
	Otherwise the field is not present.	

# SystemInformationBlockType4-NB

The IE *SystemInformationBlockType4-NB* contains neighbouring cell related information relevant only for intrafrequency cell re-selection. The IE includes cells with specific re-selection parameters.

## SystemInformationBlockType4-NB information element

ASN1START	
SystemInformationBlockType4-NB-r13 ::= intraFreqNeighCellList-r13 intraFreqBlackCellList-r13 lateNonCriticalExtension	SEQUENCE { IntraFreqNeighCellList OPTIONAL, Need OR IntraFreqBlackCellList OPTIONAL, Need OR OCTET STRING OPTIONAL,
<pre>, [[ nsss-RRM-Config-r15</pre>	NSSS-RRM-Config-NB-r15 OPTIONAL, Need OR IntraFreqNeighCellList-NB-v1530 OPTIONAL Need OR
IntraFreqNeighCellList-NB-v1530 ::= NB-v1530	SEQUENCE (SIZE (1maxCellIntra)) OF IntraFreqNeighCellInfo-

IntraFreqNeighCellInfo-NB-v1530 ::	:=	SEQUENCE {		
nsss-RRM-Config-r15		NSSS-RRM-Config-NB-r15	OPTIONAL	Cond NSSS-RRM
}				

-- ASN1STOP

}

#### SystemInformationBlockType4-NB field descriptions

intraFreqBlackCellList List of blacklisted intra-frequency neighbouring cells.

intraFreqNeighCellList

List of intra-frequency neighbouring cells with specific cell re-selection parameters.

nsss-RRM-Config

For FDD: Configuration for NSSS-based RRM measurements.

If *intraFreqNeighCellList-NB-v1530* is present then for a cell which is included in *intraFreqNeighCellList*, the UE applies the *nsss-RRM-Config* configured in the corresponding entry of *IntraFreqNeighCellList-NB-v1530*. Otherwise, the UE applies the *nsss-RRM-Config* configured in *SystemInformationBlockType4-NB-r13*.

Conditional presence	Explanation
NSSS-RRM	This field is optionally present, Need OR, when <i>nsss-RRM-Config</i> is present in <i>SystemInformationBlockType4-NB</i> . Otherwise, the field is not present, and the UE shall delete any existing value for this field.

## SystemInformationBlockType5-NB

The IE *SystemInformationBlockType5-NB* contains information relevant only for inter-frequency cell re-selection i.e. information about other NB-IoT frequencies and inter-frequency neighbouring cells relevant for cell re-selection. The IE includes cell re-selection parameters common for a frequency as well as cell specific re-selection parameters.

#### SystemInformationBlockType5-NB information element

```
-- ASN1START
SystemInformationBlockType5-NB-r13 ::= SEQUENCE {
    interFreqCarrierFreqList-r13
                                          InterFreqCarrierFreqList-NB-r13,
                                           T-Reselection-NB-r13,
    t-Reselection-r13
    lateNonCriticalExtension
                                           OCTET STRING
                                                                          OPTIONAL.
      scptm-FreqOffset-r14
                                           INTEGER (1..8)
                                                                          OPTIONAL -- Need OP
    ]]]
    ]]
}
InterFreqCarrierFreqList-NB-r13 ::= SEQUENCE (SIZE (1..maxFreq)) OF InterFreqCarrierFreqInfo-NB-
r13
InterFreqCarrierFreqInfo-NB-r13 ::= SEQUENCE {
   dl-CarrierFreq-r13
                                      CarrierFreq-NB-r13,
    q-RxLevMin-r13
                                       O-RxLevMin,
                                                                     OPTIONAL,
    q-QualMin-r13
                                       Q-QualMin-r9
                                                                                      -- Need OP
                                       P-Max
   p-Max-r13
                                                                      OPTIONAL,
                                                                                      -- Need OP
    q-OffsetFreq-r13
                                      Q-OffsetRange
                                                                      DEFAULT dB0,
   interFreqNeighCellList-r13
interFreqBlackCellList-r13
                                   InterFreqNeighCellList-NB-r13 OPTIONAL,
InterFreqBlackCellList-NB-r13 OPTIONAL,
                                                                                      -- Need OR
                                                                                      -- Need OR
    multiBandInfoList-r13
                                      MultiBandInfoList-NB-r13 OPTIONAL,
                                                                                      -- Need OR
    [[ delta-RxLevMin-v1350
                                                             OPTIONAL -- Cond Qrxlevmin
                                      INTEGER (-8..-1)
   ]],
    [[ powerClass14dBm-Offset-r14
                                      ENUMERATED {dB-6, dB-3, dB3, dB6, dB9, dB12}
OPTIONAL, -- Need OP
       ce-AuthorisationOffset-r14
                                       ENUMERATED {dB5, dB10, dB15, dB20, dB25, dB30, dB35}
    OPTIONAL -- Need OP
    ]],
       nsss-RRM-Config-r15
                                       NSSS-RRM-Config-NB-r15 OPTIONAL,
    [[
                                                                        -- Need OR
       interFreqNeighCellList-v1530 InterFreqNeighCellList-NB-v1530 OPTIONAL -- Need OR
    11
                                       CarrierFreq-NB-v1550 OPTIONAL -- Cond TDD
    [[
       dl-CarrierFreg-v1550
    ]]
```

InterFreqNeighCellList-NB-r13 ::=	SEQUENCE (SIZE (1maxCellInter)) OF PhysCellId
InterFreqNeighCellList-NB-v1530 ::= NB-v1530	SEQUENCE (SIZE (1maxCellInter)) OF InterFreqNeighCellInfo-
<pre>InterFreqNeighCellInfo-NB-v1530 ::=     nsss-RRM-Config-r15 }</pre>	SEQUENCE { NSSS-RRM-Config-NB-r15 OPTIONAL Cond NSSS-RRM
<pre>InterFreqBlackCellList-NB-r13 ::=</pre>	SEQUENCE (SIZE (1maxCellBlack)) OF PhysCellId
ASN1STOP	

## SystemInformationBlockType5-NB field descriptions

Parameter "Qoffset _{authorization} " in TS 36.304 [4]. Value in dB. Value dB5 corresponds to 5 dB, dB10 corresponds to 10 dB and so on. If the field is absent, the UE applies the value of ce- <i>authorisationOffset</i> in SystemInformationBlockType1-NB. InterFreqBlackCellList List of blacklisted inter-frequency neighbouring cells. InterFreqCarrierFreqList List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency regardless of the E-ARFCN used to indicate this. InterFreqNeighCellList List of inter-frequency neighbouring cells. E-UTRAN may include interFreqNeighCellList when including InterFreqNeighCellList List of inter-frequency neighbouring cells. E-UTRAN may include interFreqNeighCellList when including InterFreqNeighCellList. Dist of inter-frequency neighbouring cells. E-UTRAN may include interFreqNeighCellList when including InterFreqNeighCellList. The v1530 to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification.	SystemInformationBlockType5-NB field descriptions		
B and so on. If the field is absent, the UE applies the value of ce-authorisationOffset in         SystemInformationBlockType1-NB.         InterFregBlackCellList         ist of blacklisted inter-frequency neighbouring cells.         InterFreqDerrierFreqList         ist of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency neighbouring cells.         InterFreqDerigPCellList         ist of inter-frequency neighbouring cells. E-UTRAN may include interFreqNeighCellList when including interFreqNeighCellList-NB-v1530 to provide cell specific NSSS-based measurement configuration. The UE that does out support NSSS-based RRM measurements shall ignore this field in this version of the specification.         multiBandInfoList       nndicates the list of frequency bands, with the associated additionalPmax and additionalSpectrumEmission values as telined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dI-CarrierFreqNeighCellList, the UE spplies the insss-RRM-Config configured in the corresponding entry of InterFreqNeighCellList, the UE spplies the insss-RRM-Config configured in the corresponding entry of InterFreqNeighCellList, the UE applies the insss-RRM-Config configured in InterFreqCarrierFreqInfo.         -Max       //Max         /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum sover according to the UE capability.         >owerClass14dBm-Offset         'arameter 'Qoffset' in TS 36.304 [4]. Only applicable for UE supporting powerClass/NB-14dBm. Value in dB. Value dB- corresponds to -3 dB and so on. If the field is abse	ce-AuthorisationOffset		
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SystemInformationBlockType1-NB. merFreqBlackCellList ist of blacklisted inter-frequency neighbouring cells. interFreqCarrierFreqList ist of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency regardless of the E-ARFCN used to indicate this. merFreqNeighCellList ist of inter-frequency neighbouring cells. E-UTRAN may include <i>interFreqNeighCellList</i> when including interFreqNeighCellList. ist of inter-frequency neighbouring cells. E-UTRAN may include <i>interFreqNeighCellList</i> when including interFreqNeighCellList. ist of inter-frequency bands, with the associated <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection arameters are common. <b>isss-RRM-Config</b> or FDD: Configuration for NSSS-based RRM measurements. InterFreqNeighCellList.NB-v1530 is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE InterFreqNeighCellList.NB-v1530 is present then for a cell which is included in <i>interFreqNeighCellList</i> . the UE InterFreqNeighCellList.NB-v1530 is present then for a cell which is included in <i>interFreqNeighCellList</i> . the UE pipelies the <i>nsss-RRM-Config</i> configured in InterFreqCarrierFreqInto. <b>PMax</b> // Alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum ower cacording to the UE capability. <b>DeveClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4]. only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Q _{releventin} = q-RxLevMin * 2 [dBm]. <b>FREVMIN, delta-RxLevMin</b> arameter "Quantini" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Q _{releventin} = q-RxLevMin * 2 [dBm]. <b>felid:</b> a			
InterFreqDiacKCeIIList         List of blacklisted inter-frequency neighbouring cells.         InterFreqCarrierFreqList         List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency regardless of the E-ARFCN used to indicate this.         InterFreqNeighCeIIList         List of inter-frequency neighbouring cells. E-UTRAN may include interFreqNeighCeIIList when including inter-freqNeighCeIIList N=N=V530 to provide cell specific NSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification.         multiBandInfoList         ndicates the list of frequency bands, with the associated additionalPmax and additionalSpectrumEmission values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dI-CarrierFreq for which cell reselection parameters are common.         msss-RRM-Config         For FDD: Configuration for NSSS-based RRM measurements.         InterFreqNeighCeIIList-NB=v1530 is present then for a cell which is included in interFreqNeighCeIIList, the UE applies the nsss-RRM-Config configured in InterFreqCarrierFreqInCo.         value applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power caccrding to the UE capability.         vower according to the UE capability.         varameter "Poffset" in TS 36			
List of blacklisted inter-frequency neighbouring cells. <i>InterFreqCarrierFreqList</i> List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency regardless of the E-ARFCN used to indicate this. <i>InterFreqNeighCellList</i> List of inter-frequency neighbouring cells. E-UTRAN may include <i>interFreqNeighCellList</i> when including <i>InterFreqNeighCellList</i> -NB-v1530 to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification. <i>IntiliBandInfoList</i> ndicates the list of frequency bands, with the associated <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection barameters are common. <b>InterFreqNeighCellList-NB-v1530</b> is present then for a cell which is included in <i>interFreqNeighCellList</i> . the UE spplies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in InterFreqCarrierFreqNeighCellList-NB-v1530. Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in InterFreqCarrierFreqInfo. <b>InterFreqNeighCellList-NB-v1530</b> . Otherwise, he UE applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum <i>Jower</i> Cascrding to the UE capability. <b>DeverClass14dBm-Offset</b> Parameter "Noffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>FuelWilin, deita-RxLevMin</b> Parameter "Quadmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Quadmin. <b>FrXLevMin deita-RxLevMin</b> Parameter "Quadmin" in TS 36.304 [4	interFreqBlackCellList		
InterFreqCarrierFreqList         List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency regardless of the E-ARFCN used to indicate this.         Inter-FreqNeighCellList         List of inter-frequency regardless of the E-ARFCN used to indicate this.         InterFreqNeighCellList.NB-v1530 to provide cell specific NSS-based measurement configuration. The UE that does not support NSS-based RRM measurements shall ignore this field in this version of the specification.         multiBandInfoList         ndicates the list of frequency bands, with the associated additionalPmax and additionalSpectrumEmission values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dI-CarrierFreq for which cell reselection barameters are common.         Siss-RRM-Config         For FDD: Configuration for NSSS-based RRM measurements.         I InterFreqNeighCellList-NB-v1530 is present then for a cell which is included in interFreqNeighCellList.NB-v1530. Otherwise, he UE applies the nsss-RRM-Config configured in InterFreqCarrierFreqInfo.         -Max         Alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability.         powerClass14dBm-Offset         "arameter "Poffset" in TS 36.304 [4], only applicable for UE supporting powerClassNB-14dBm. Value in dB. Value dB-0 orresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of negative infinity for QualMin         "arameter "QualFisetIrreq			
List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical requency regardless of the E-ARFCN used to indicate this. <i>InterFreqNeighCellList</i> List of inter-frequency neighbouring cells. E-UTRAN may include <i>interFreqNeighCellList</i> when including <i>interFreqNeighCellList-NB-v1530</i> to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification. <i>multiBandInfoList</i> ndicates the list of frequency bands, with the associated <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values as lefined in T3 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection <i>narameters</i> are common. <b>1sss-RRM-Config</b> or FDD: Configuration for NSSS-based RRM measurements. <i>I InterFreqNeighCellList-NB-v1530</i> is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, the UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <b>-Max</b> <i>Alue</i> applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the <i>maximum</i> bower according to the UE capability. <b>DrewFreq</b> <b>Parameter</b> "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- 3 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value <i>f</i> <b>Offset</b> in TS 36.304 [4]. <b>1 <i>f</i> delta-RxLevMin in TS 36.304 [4]. <b>1 <i>f</i> delta-RxLevMin in TS 36.304 [4]. <b>1 <i>f</i> delta-RxLevMin in TS 36.304 [4]. <b>1 <i>f</i> delta-RxLevMin in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q_{ottewmin} = <i>q</i>-<i>RxLevMin</i> * 2 [dBm]. <b>1 <i>f</i> delta-RxLevMin in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q_{ottewmin} = <i>q</i>-<i>RxLevMin</i> * 2</b></b></b></b></b>	interFreqCarrierFreqList		
requency regardless of the E-ARFCN used to indicate this. <i>InterFreqNeighCellList</i> . <i>Ist of interFreqNeighCellList-NB-v1530</i> to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification. <i>InuliBandInGList</i> ndicates the list of frequency bands, with the associated <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values as defined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection <i>inarameters</i> are common. <i>Inss-RRM-Config</i> For FDD: Configuration for NSSS-based RRM measurements. <i>I InterFreqNeighCellList-NB-v1530</i> is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <i>D-Max</i> /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum <i>powerClass1dBm-Offset</i> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <i>PoffsetFreq</i> Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter "CoffsetFreq Parameter CoffsetSecrem in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Qnewrin = <i>q-RxLevMin</i> * 2 [dBm]. <i>i delta-RxLevMin</i> is included, actual value Qnewrin = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <i>i delta-RxLevMin</i> is included, actual value Qnewrin = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <i>i delta-RxLevMin</i> in TS 36.304 [4]. Actual value Qoffsetscrem = f	List of neighbouring inter-frequencies. E-UTRAN does not configure more than one entry for the same physical		
Inter-FreqNeighCellList         List of inter-freqUency neighbouring cells. E-UTRAN may include <i>interFreqNeighCellList</i> when including <i>interFreqNeighCellList-NB-v1530</i> to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification.         multiBandInfoList       noticates the list of frequency bands, with the associated <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values as tefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection varameters are common.         Isss-RRM-Config       For CDD: Configuration for NSSS-based RRM measurements.         [ InterFreqNeighCellList-NB-v1530 is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> .         D-Max       publicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum noveer according to the UE capability.         DowerClass14dBm-Offset       Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of negative infinity for Quantum.         PoffsetFreq       Parameter "Quantum" in TS 36.304 [4].         -Quantum       max         Parameter "Quantum" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Quantum" in TS 36.304 [4].	frequency regardless of the E-ARFCN used to indicate this.		
InterFreq/NeighCellList-NB-v1530 to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification.         InultiBandInoList         ndicates the list of frequency bands, with the associated additionalPmax and additionalSpectrumEmission values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dI-CarrierFreq for which cell reselection barameters are common.         The SSS-RRM-Config         For FDD: Configuration for NSSS-based RRM measurements.         f InterFreqNeighCellList-NB-v1530 is present then for a cell which is included in interFreqNeighCellList.NB-v1530. Otherwise, he UE applies the nsss-RRM-Config configured in the corresponding entry of InterFreqNeighCellList-NB-v1530. Otherwise, he UE applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum bower according to the UE capability.         Drower Class14dBm-Offset         Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting powerClassNB-14dBm. Value in dB. Value dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value for dB for "Poffset" in TS 36.304 [4].         P-OffsetFreq         Parameter "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin.         Parameter "Qeualmin" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Qrxlevmin = q-RxLevMin * 2 [dBm].         Contention.         Parameter "Qeualmin" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Qr	interFreqNeighCellList		
InterFreq/NeighCellList-NB-v1530 to provide cell specific NSSS-based measurement configuration. The UE that does not support NSSS-based RRM measurements shall ignore this field in this version of the specification.         InultiBandInoList         Indicates the list of frequency bands, with the associated additionalPmax and additionalSpectrumEmission values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dI-CarrierFreq for which cell reselection barameters are common.         The SSS-RRM-Config         For FDD: Configuration for NSSS-based RRM measurements.         f InterFreqNeighCellList-NB-v1530 is present then for a cell which is included in interFreqNeighCellList.NB-v1530. Otherwise, he UE applies the nsss-RRM-Config configured in the corresponding entry of InterFreqNeighCellList-NB-v1530. Otherwise, he UE applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum bower according to the UE capability.         Drower Class14dBm-Offset         Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting powerClassNB-14dBm. Value in dB. Value dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value fo dB for "Poffset" in TS 36.304 [4].         P-OffsetFreq         Parameter "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin.         Parameter "Qeventin" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Qrxlevmin = q-RxLevMin * 2 [dBm].         Contention.         Parameter "Qeventin" in TS 36.304 [4]. If delta-RxLevMin is not included, actual value Qr			
not support NSSS-based RRM measurements shall ignore this field in this version of the specification. <b>multiBandInfoList</b> <b>nultiBandInfoList</b> ndicates the list of frequency bands, with the associated <i>additionalPmax</i> and <i>additionalSpectrumEmission</i> values as lefined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection barameters are common. <b>sss-RRM-Config</b> or FDD: Configuration for NSSS-based RRM measurements. I <i>InterFreqNeighCellList-NB-v1530</i> is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, the UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <b>&gt;-Max</b> /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum <b>powerClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>-OffsetFreq</b> Parameter "Qoffset _{trequency} " in TS 36.304 [4]. <b>-PaulMin</b> Parameter "Qoffset _{trequency} " in TS 36.304 [4]. <b>-PaulMin</b> Parameter "Qoffset _{trequency} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rotevrnin} = <i>q-RxLevMin</i> * 2 [dBm]. <b>f</b> <i>delta-RxLevMin</i> is included, actual value Q _{rotevrnin} = ( <i>q-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. <b>f</b> the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS <b>6</b> .304 [4]. <b>-Reselection</b>			
multiBandInfoList         ndicates the list of frequency bands, with the associated additionalPmax and additionalSpectrumEmission values as termination in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection arrameters are common.         TSSS-RRM-Config         For FDD: Configuration for NSSS-based RRM measurements.         f InterFreqNeighCellList-NB-v1530 is present then for a cell which is included in interFreqNeighCellList, the UE applies the nsss-RRM-Config configured in the corresponding entry of InterFreqNeighCellList-NB-v1530. Otherwise, he UE applies the nsss-RRM-Config configured in InterFreqCarrierFreqInfo.         -Max         /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability.         powerClass14dBm-Offset         *arameter "Poffset" in TS 36.304 [4], only applicable for UE supporting powerClassNB-14dBm. Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4].         -qualMin         *arameter "Qualemin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin.         *arameter "Qualmin"         *arameter "Qualmin" in TS 36.304 [4]. If delta-RxLev/Min is not included, actual value Qualemin = q-RxLev/Min * 2 [dBm].         *cpture.reqOffset         *arameter "Qualmin" in TS 36.304 [4]. If delta-RxLev/Min is not included, actual value Qualemin.			
terined in TS 36.101 [42], clause 6.2.4, in addition to the band represented by dl-CarrierFreq for which cell reselection harameters are common. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing.org/commons. https://www.mailing. https://www.mailing.org/commons. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://www.mailing. https://wwww.mailing. https://wwww.mailing. https://wwww.mailing. https://wwww	multiBandInfoList		
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barameters are common. <b>1555-RRM-Config</b> For FDD: Configuration for NSSS-based RRM measurements. <i>f InterFreqNeighCellList-NB-v1530</i> is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <b>5-Max</b> Value applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum bower according to the UE capability. <b>5-OPMEX</b> Value applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum bower according to the UE capability. <b>5-OPMEX</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- 6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>7-OffsetFreq</b> Parameter "Qotfsetrrequency" in TS 36.304 [4]. <b>7-QualMin</b> Parameter "Qualmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not present, the UE applies the (default) value of negative infinity for Qualmin. <b>7-RkevMin, delta-RxLevMin</b> Parameter "Qualmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{intermin} = <i>q-RxLevMin</i> * 2 [dBm]. <b>5-ptm-FreqOffset</b> Parameter Qoffsets _{CPTM} in TS 36.304 [4]. Actual value Qoffsets _{CPTM} = field value * 2 [dB]. <b>1</b> the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS <b>6</b> :304 [4]. <b>-Reselection</b>			
<b>nsss-RRM-Config</b> For FDD: Configuration for NSSS-based RRM measurements. <i>f InterFreqNeighCellList-NB-v1530</i> is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <b>DrMax</b> Yalue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability. <b>DowerClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB-6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>P-OffsetFreq</b> Parameter "Qoffsetrifequency" in TS 36.304 [4]. <b>P-QualMin</b> Parameter "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin. <b>P-RxLevMin, delta-RxLevMin</b> Parameter "Qualmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Qnewrin = q-RxLevMin * 2 [dBm]. <b>f delta-RxLevMin</b> is included, actual value Qnewrin = (q-RxLevMin + delta-RxLevMin) * 2 [dBm]. <b>f celta-RxLevMin</b> Parameter "QRtewrin" in TS 36.304 [4]. Actual value Qoffsets _{CPTM} = field value * 2 [dB].         f the field is absent, the UE uses infinite dBs for the S			
For FDD: Configuration for NSSS-based RRM measurements. f InterFreqNeighCellList-NB-v1530 is present then for a cell which is included in <i>interFreqNeighCellList</i> , the UE applies the <i>nsss-RRM-Config</i> configured in the corresponding entry of <i>InterFreqNeighCellList-NB-v1530</i> . Otherwise, he UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <b>D-Max</b> /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability. <b>DowerClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>PoffsetFreq</b> Parameter "Qoffsettrequency" in TS 36.304 [4]. <b>PoffsetFreq</b> Parameter "Qualmin" Parameter "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin. <b>PrAkevMin, delta-RxLevMin</b> Parameter "QRxLevmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{trklevmin} = <i>q-RxLevMin</i> * 2 [dBm]. <b>for delta-RxLevMin</b> is included, actual value Q _{trklevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>for the field is absent</b> , the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 6.304 [4]. <b>Feselection</b>			
f InterFreqNeighCeIIList-NB-v1530 is present then for a cell which is included in interFreqNeighCeIIList, the UE applies the nsss-RRM-Config configured in the corresponding entry of InterFreqNeighCeIIList-NB-v1530. Otherwise, he UE applies the nsss-RRM-Config configured in InterFreqCarrierFreqInfo. <b>DrMax</b> Value applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum bower according to the UE capability. <b>DowerClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting powerClassNB-14dBm. Value in dB. Value dB- 6 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>7-OffsetFreq</b> Parameter "Qoffset <u>frequency</u> " in TS 36.304 [4]. <b>7-QualMin</b> Parameter "Qqualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin. <b>9-RXLevMin, delta-RxLevMin</b> Parameter "QRxLevmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxtevmin} = q-RxLevMin * 2 [dBm]. <b>1</b> delta-RxLevMin is included, actual value Q _{rxtevmin} = (q-RxLevMin + delta-RxLevMin) * 2 [dBm]. <b>5:cptm-FreqOffset</b> Parameter Qoffsets _{CCTTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS <b>6</b> :304 [4]. <b>•Reselection</b>			
applies the nsss-RRM-Config configured in the corresponding entry of InterFreqNeighCellList-NB-v1530. Otherwise, he UE applies the nsss-RRM-Config configured in InterFreqCarrierFreqInfo. <b>D-Max</b> /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum bower according to the UE capability. <b>DowerClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- 5 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4] <b>PoffsetFreq</b> Parameter "Qoffsettrequency" in TS 36.304 [4]. <b>PofulMin</b> Parameter "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin Parameter "QRxLevrmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Qrxlevrmin = q-RxLevMin * 2 [dBm]. f <i>delta-RxLevMin</i> is included, actual value Qrxlevrmin = (q-RxLevMin + delta-RxLevMin) * 2 [dBm]. <b>Scptm-FreqOffset</b> Parameter Qoffsets _{CCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>Preselection</b>			
he UE applies the <i>nsss-RRM-Config</i> configured in <i>InterFreqCarrierFreqInfo</i> . <b>DrMax</b> /alue applicable for the neighbouring NB-IoT cells on this carrier frequency. If absent the UE applies the maximum power according to the UE capability. <b>DrowerClass14dBm-Offset</b> Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4]. <b>DroffsetFreq</b> Parameter "Qoffset _{frequency} " in TS 36.304 [4]. <b>DroffsetFreq</b> Parameter "Qualmin" <b>Parameter</b> "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin. <b>DroffsetFreq</b> Parameter "QRxLevmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Qrxlevmin = q-RxLevMin * 2 [dBm]. <b>f</b> <i>delta-RxLevMin</i> is included, actual value Qrxlevmin = (q-RxLevMin + delta-RxLevMin) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>Preselection</b>			
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powerClass14dBm-Offset         Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- 5 corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4] <i>g-OffsetFreq</i> Parameter "Qoffsetf _{requency} " in TS 36.304 [4]. <i>g-QualMin</i> Parameter "Qualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin. <i>g-RxlevMin</i> , <i>delta-RxLevMin</i> Parameter "QRxLevmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. <i>f delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <i>f delta-RxLevMin</i> in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. <i>f</i> the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <i>f</i> the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4].			
Parameter "Poffset" in TS 36.304 [4], only applicable for UE supporting <i>powerClassNB-14dBm</i> . Value in dB. Value dB- corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4] <b>p-OffsetFreq</b> Parameter "Qoffset _{frequency} " in TS 36.304 [4]. <b>g-QualMin</b> Parameter "Q _{qualmin} " in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Q _{qualmin} . <b>g-RxlevMin, delta-RxLevMin</b> Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. <b>f</b> <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. <b>f</b> the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>*Reselection</b>			
S corresponds to -6 dB, dB-3 corresponds to -3 dB and so on. If the field is absent, the UE applies the (default) value of 0 dB for "Poffset" in TS 36.304 [4] <b>g-OffsetFreq</b> Parameter "Qoffset _{frequency} " in TS 36.304 [4]. <b>g-QualMin</b> Parameter "Q _{qualmin} " in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qualmin. <b>g-RxlevMin</b> , <b>delta-RxLevMin</b> Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>5cptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>*Reselection</b>			
of 0 dB for "Poffset" in TS 36.304 [4] <b>g-OffsetFreq</b> Parameter "Qoffset _{frequency} " in TS 36.304 [4]. <b>g-QualMin</b> Parameter "Qqualmin" in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Qqualmin. <b>g-RxlevMin, delta-RxLevMin</b> Parameter "QRxLevmin" in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm].         f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffsets _{CCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCCPTM} = field value * 2 [dB].         f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>6</b> -304 [4]. <b>6</b> -Reselection			
Parameter "Qoffset _{frequency} " in TS 36.304 [4]. <b>g-QualMin</b> Parameter "Q _{qualmin} " in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Q _{qualmin} . <b>g-RxlevMin</b> , <b>delta-RxLevMin</b> Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>*Reselection</b>			
Parameter "Qoffset _{frequency} " in TS 36.304 [4]. <b>q-QualMin</b> Parameter "Q _{qualmin} " in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Q _{qualmin} . <b>q-RxlevMin, delta-RxLevMin</b> Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. If <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. If the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>Freselection</b>			
<i>q</i> -QualMin         Parameter "Q _{qualmin} " in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for         Q _{qualmin} . <i>q</i> -RxlevMin, delta-RxLevMin         Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q</i> -RxLevMin * 2 [dBm]. <i>f</i> delta-RxLevMin is included, actual value Q _{rxlevmin} = ( <i>q</i> -RxLevMin + delta-RxLevMin) * 2 [dBm]. <i>scptm-FreqOffset</i> Parameter Qoffsets _{CPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB].         f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <i>s</i> -Reselection			
Parameter "Q _{qualmin} " in TS 36.304 [4]. If the field is not present, the UE applies the (default) value of negative infinity for Q _{qualmin} . <b>Q-RxlevMin, delta-RxLevMin</b> Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffsets _{CCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>*Reselection</b>			
Qualmin. <b>q-RxlevMin, delta-RxLevMin</b> Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm].         f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm].         scptm-FreqOffset         Parameter Qoffsets _{CCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB].         f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4].         63.304 [4]. <b>*</b> Reselection			
Parameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>c-Reselection</b>			
² arameter "Q _{RxLevmin} " in TS 36.304 [4]. If <i>delta-RxLevMin</i> is not included, actual value Q _{rxlevmin} = <i>q-RxLevMin</i> * 2 [dBm]. f <i>delta-RxLevMin</i> is included, actual value Q _{rxlevmin} = ( <i>q-RxLevMin</i> + <i>delta-RxLevMin</i> ) * 2 [dBm]. <b>Scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>5Reselection</b>			
f delta-RxLevMin is included, actual value Q _{rxlevmin} = (q-RxLevMin + delta-RxLevMin) * 2 [dBm]. <b>Scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>FReselection</b>			
<b>Scptm-FreqOffset</b> Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. <b>FReselection</b>			
Parameter Qoffset _{SCPTM} in TS 36.304 [4]. Actual value Qoffset _{SCPTM} = field value * 2 [dB]. f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. - <b>Reselection</b>			
f the field is absent, the UE uses infinite dBs for the SC-PTM frequency offset with cell ranking as specified in TS 36.304 [4]. -Reselection			
36.304 [4]. -Reselection			
Reselection			
rarameter "TreselectionNB-IoT_Inter" IN TS 36.304 [4].			
	Parameter "Treselection _{NB-loT_Inter} " In TS 36.304 [4].		

Conditional presence	Explanation	
NSSS-RRM	This field is optionally present, Need OR, when <i>nsss-RRM-Config</i> is present in	
	InterFreqCarrierFreqInfo. Otherwise, the field is not present, and the UE shall delete any	
	existing value for this field.	
Qrxlevmin	This field is optionally present, Need OR, if <i>q</i> - <i>RxLevMin</i> is set to the minimum value.	
	Otherwise the field is not present.	
TDD	The field is optionally present, Need OR, in TDD. Otherwise, the field is not present.	

## SystemInformationBlockType14-NB

The IE SystemInformationBlockType14-NB contains the AB parameters.

#### SystemInformationBlockType14-NB information element

```
-- ASN1START
SystemInformationBlockType14-NB-r13 ::= SEQUENCE {
        Param-r13 CHOICE {
ab-Common-r13 AB-Co
ab-PerPLMN-List-r13 SEQUI
    ab-Param-r13
                                           AB-Config-NB-r13,
                                            SEQUENCE (SIZE (1..maxPLMN-r11)) OF AB-ConfigPLMN-NB-r13
                                                                      OPTIONAL, -- Need OR
    lateNonCriticalExtension OCTET STRING
                                                                      OPTIONAL,
     [[
        ab-PerNRSRP-r15
                                      ENUMERATED {thresh1, thresh2} OPTIONAL -- Need OR
    ]]
}
AB-ConfigPLMN-NB-r13 ::= SEQUENCE {
    ab-Config-r13
                                       AB-Config-NB-r13
                                                             OPTIONAL -- Need OR
}
AB-Config-NB-r13 ::=
ab-Category-r13
                              SEQUENCE {
                            ENUMERATED {a, b, c},
BIT STRING (SIZE(10)),
    ab-BarringBitmap-r13
    ab-BarringForExceptionData-r13 ENUMERATED {true}
ab-BarringForSpecialAC-r13 BIT STRING (SIZE(5))
                                                                      OPTIONAL, -- Need OP
}
```

```
-- ASN1STOP
```

-- ASN1START

SystemInformationBlockType14-NB field descriptions	
p-BarringBitmap	
ccess class barring for AC 0-9. The first/ leftmost bit is for AC 0, the second bit is for AC 1, and so on.	
p-BarringForExceptionData	
dicates whether ExceptionData is subject to access barring.	
p-BarringForSpecialAC	
ccess class barring for AC 11-15. The first/ leftmost bit is for AC 11, the second bit is for AC 12, and so on.	
p-Category	
dicates the category of UEs for which AB applies. Value a corresponds to all UEs, value b corresponds to the	UEs
at are neither in their HPLMN nor in a PLMN that is equivalent to it, and value $c$ corresponds to the UEs that $a$	are
ither in the PLMN listed as most preferred PLMN of the country where the UEs are roaming in the operator-d	lefined
MN selector list on the USIM, nor in their HPLMN nor in a PLMN that is equivalent to their HPLMN, see TS 2.	2.011
0].	
-Common	
ne AB parameters applicable for all PLMN(s).	
p-PerNRSRP	
ccess barring per NRSRP. Value thresh1 corresponds to the first entry configured in rsrp-ThresholdsPrachInfo	oList,
lue thresh2 corresponds to the second entry configured in rsrp-ThresholdsPrachInfoList.	
p-PerPLMN-List	
ne AB parameters per PLMN, listed in the same order as the PLMN(s) occur in <i>plmn-IdentityList</i> in	
/stemInformationBlockType1-NB.	

## SystemInformationBlockType15-NB

The IE SystemInformationBlockType15-NB contains the MBMS Service Area Identities (SAI) of the current and/ or neighbouring carrier frequencies.

### SystemInformationBlockType15-NB information element

```
SystemInformationBlockType15-NB-r14 ::= SEQUENCE {
    mbms-SAI-IntraFreq-r14 MBMS-SAI-List-r11 OPTIONAL, -- Need OR
    mbms-SAI-InterFreqList-r14 MBMS-SAI-InterFreqList-NB-r14 OPTIONAL, -- Need OR
    lateNonCriticalExtension OCTET STRING OPTIONAL,
    ...
}
```

MBMS-SAI-InterFreqList-NB-r14 ::=	SEQUENCE (SIZE (1maxFreq)) OF MBMS-SAI-InterFreq-NB-r14
<pre>MBMS-SAI-InterFreq-NB-r14 ::=     dl-CarrierFreq-r14     mbms-SAI-List-r14     multiBandInfoList-r14 }</pre>	SEQUENCE { CarrierFreq-NB-r13, MBMS-SAI-List-r11, AdditionalBandInfoList-NB-r14 OPTIONAL Need OR
ASN1STOP	

#### SystemInformationBlockType15-NB field descriptions

#### mbms-SAI-InterFreqList

Contains a list of neighboring frequencies including additional frequency bands, if any, that provide MBMS services and the corresponding MBMS SAIs.

#### mbms-SAI-IntraFreq

Contains the list of MBMS SAIs for the current frequency. A duplicate MBMS SAI indicates that this and all following SAIs are not offered by this cell but only by neighbour cells on the current frequency. For MBMS service continuity, the UE shall use all MBMS SAIs listed in *mbms-SAI-IntraFreq* to derive the MBMS frequencies of interest. *mbms-SAI-List* 

Contains a list of MBMS SAIs for a specific frequency.

#### multiBandInfoList

-- ASN1START

A list of additional frequency bands applicable for the cells participating in the SC-PTM transmission.

## SystemInformationBlockType16-NB

The IE *SystemInformationBlockType16-NB* contains information related to GPS time and Coordinated Universal Time (UTC). The UE may use the parameters provided in this system information block to obtain the UTC, the GPS and the local time.

```
-- ASN1START
SystemInformationBlockType16-NB-r13 ::= SystemInformationBlockType16-r11
-- ASN1STOP
```

## SystemInformationBlockType20-NB

For FDD, the IE *SystemInformationBlockType20-NB* contains the information required to acquire the control information associated with transmission of MBMS using SC-PTM.

#### SystemInformationBlockType20-NB information element

```
SystemInformationBlockType20-NB-r14 ::= SEQUENCE {
    npdcch-SC-MCCH-Config-nl4 NPDCCH-SC-MCCH-Config-NB-r14,
    sc-mcch-CarrierConfig-r14
                                          CHOICE {
        dl-CarrierConfig-r14
                                               DL-CarrierConfigCommon-NB-r14,
       dl-CarrierIndex-r14
                                               INTEGER (0.. maxNonAnchorCarriers-NB-r14)
    },
    sc-mcch-RepetitionPeriod-r14
                                           ENUMERATED {rf32, rf128, rf512, rf1024,
                                                       rf2048, rf4096, rf8192, rf16384},
    sc-mcch-Offset-r14
                                           INTEGER (0..10)
    sc-mcch-ModificationPeriod-r14
                                           ENUMERATED { rf32, rf128, rf256, rf512, rf1024,
                                                  rf2048, rf4096, rf8192, rf16384, rf32768,
                                                   rf65536, rf131072, rf262144, rf524288,
                                                   rf1048576, spare1},
    sc-mcch-SchedulingInfo-r14
                                           SC-MCCH-SchedulingInfo-NB-r14
                                                                              OPTIONAL,
                                                                                          -- Need
OP
    lateNonCriticalExtension
                                           OCTET STRING
                                                                              OPTIONAL,
}
NPDCCH-SC-MCCH-Config-NB-r14 ::= SEQUENCE {
                                          ENUMERATED {r1, r2, r4, r8, r16,
    npdcch-NumRepetitions-SC-MCCH-r14
                                                       r32, r64, r128, r256,
                                                       r512, r1024, r2048},
```

	npdcch-StartSF-SC-MCCH-r14	ENUMERATED {vldot5, v2, v4, v8,
		v16, v32, v48, v64},
	npdcch-Offset-SC-MCCH-r14	ENUMERATED {zero, oneEighth, oneQuarter, threeEighth, oneHalf, fiveEighth,
		threeQuarter, sevenEighth}
}		······································
í		
S	C-MCCH-SchedulingInfo-NB-r14::= SEQUENC	
	onDurationTimerSCPTM-r14	ENUMERATED {
		pp1, pp2, pp3, pp4,
		pp8, pp16, pp32, spare},
	drx-InactivityTimerSCPTM-r14	ENUMERATED { pp0, pp1, pp2, pp3,
		$pp0, pp1, pp2, pp3, pp3, pp4, pp8, pp16, pp32 \},$
	schedulingPeriodStartOffsetSCPTM-r14	CHOICE {
	sf10	INTEGER(09),
	sf20	INTEGER(019),
	sf32	<pre>INTEGER(031),</pre>
	sf40	<pre>INTEGER(039),</pre>
	sf64	INTEGER(063),
	sf80	INTEGER(079),
	sf128	INTEGER(0127),
	sf160 sf256	INTEGER(0159), INTEGER(0255),
	sf320	INTEGER(0255), INTEGER(0319),
	sf512	INTEGER(0511),
	sf640	INTEGER(0639),
	sf1024	INTEGER(01023),
	sf2048	INTEGER(02047),
	sf4096	INTEGER(04095),
	sf8192	INTEGER(08191)
	},	
1	•••	
}		
	- ASN1STOP	

SystemInformationBlockType20-NB field descriptions	
dl-CarrierConfig	
Downlink carrier used for SC-MCCH. E-UTRAN cannot configure a downlink carrier operating in mixed operat	ion
mode.	
dl-CarrierIndex	
Index to a downlink carrier signalled in system information. Value '0' corresponds to the anchor carrier, value '	
corresponds to the first entry in dl-ConfigList in SystemInformationBlockType22-NB, value '2' corresponds to the	he
second entry in <i>dl-ConfigList</i> and so on.	
drx-InactivityTimerSCPTM	
Timer for SC-MCCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value pp1 corresponds	to 1
NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on.	
npdcch-NumRepetitions-SC-MCCH	
The maximum number of NPDCCH repetitions the UE needs to monitor for SC-MCCH multicast search space	, see TS
36.213 [23].	
npdcch-Offset-SC-MCCH	
Fractional period offset of starting subframe for NPDCCH multicast search space for SC-MCCH, see TS 36.21	3 [23].
npdcch-StartSF-SC-MCCH	
Starting subframes configuration of the NPDCCH multicast search space for SC-MCCH, see TS 36.213 [23].	
onDurationTimerSCPTM	
Timer for SC-MCCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value pp1 corresponds	to 1
NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on.	
schedulingPeriodStartOffsetSCPTM	
SCPTM-SchedulingCycle and SCPTM-SchedulingOffset in TS 36.321 [6]. The value of SCPTM-SchedulingCy	
number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub-frames and so c	n. The
value of SCPTM-SchedulingOffset is in number of sub-frames.	
sc-mcch-CarrierConfig	
Downlink carrier that is used for SC-MCCH.	
sc-mcch-ModificationPeriod	
Defines periodically appearing boundaries, i.e. radio frames for which (H-SFN * 1024 +SFN) mod sc-mcch-	
ModificationPeriod = 0. The contents of different transmissions of SC-MCCH information can only be different	if there
s at least one such boundary in-between them. Value rf32 corresponds to 32 radio frames, value rf128 corres	ponds t
128 radio frames and so on.	
sc-mcch-Offset	
Indicates, together with the sc-mcch-RepetitionPeriod, the boundary of the repetition period: (H-SFN * 1024 +	SFN)
mod sc-mcch-RepetitionPeriod = sc-mcch-Offset.	
sc-mcch-RepetitionPeriod	
Defines the interval between transmissions of SC-MCCH information, in radio frames. Value rf32 corresponds	to 32
radio frames, rf128 corresponds to 128 radio frames and so on.	
sc-mcch-SchedulingInfo	
DRX information for the SC-MCCH. If the field is absent, DRX is not used for SC-MCCH reception.	

_

# SystemInformationBlockType22-NB

The IE SystemInformationBlockType22-NB contains radio resource configuration for paging and random access procedure on non-anchor carriers.

## SystemInformationBlockType22-NB information element

ASN1START		
SystemInformationBlockType22-NB-r14 ::=	SEQUENCE {	
dl-ConfigList-r14	DL-ConfigCommonList-NB-r14 OPT	IONAL, Need OR
ul-ConfigList-r14	UL-ConfigCommonList-NB-r14 OPT	IONAL, Need OR
pagingWeightAnchor-r14	2	IONAL, Cond pcch-config
nprach-ProbabilityAnchorList-r14	NPRACH-ProbabilityAnchorList-NB	, 1 3
	MFRACII FIODADIIICYAIICIIOIIIISC ND	114 OFIIONAL, CONd
nprach-config		
lateNonCriticalExtension	OCTET STRING	OPTIONAL,
• • • 1		
[[ mixedOperationModeConfig-r15	SEQUENCE {	
dl-ConfigListMixed-r15	DL-ConfigCommonList-NB-r14	OPTIONAL, Cond dl-
ConfigList	-	
ul-ConfigListMixed-r15	UL-ConfigCommonList-NB-r14	OPTIONAL, Cond ul-
ConfigList	02 001119000112120 112 111	orritonally oona ar
5		ODUTONAL Nood OD
pagingDistribution-r15	ENUMERATED {true}	OPTIONAL, Need OR
nprach-Distribution-r15	ENUMERATED {true}	OPTIONAL Need OR
}		OPTIONAL, Need OR
ul-ConfigList-r15	UL-ConfigCommonListTDD-NB-r15	OPTIONAL Cond TDD
]]		

}

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```
DL-ConfigCommonList-NB-r14 ::= SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF
                                           DL-ConfigCommon-NB-r14
UL-ConfigCommonList-NB-r14 ::=
                                  SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF
                                           UL-ConfigCommon-NB-r14
UL-ConfigCommonListTDD-NB-r15 ::= SEQUENCE (SIZE (1.. maxNonAnchorCarriers-NB-r14)) OF
                                           UL-ConfigCommonTDD-NB-r15
DL-ConfigCommon-NB-r14 ::=
                                   SEQUENCE {
   dl-CarrierConfig-r14
                                       DL-CarrierConfigCommon-NB-r14,
   pcch-Config-r14
                                       PCCH-Config-NB-r14 OPTIONAL, -- Need OR
    . . .
    [[ wus-Config-r15
                                       WUS-ConfigPerCarrier-NB-r15
                                                                      OPTIONAL -- Cond WUS
    11
}
PCCH-Config-NB-r14 ::=
                                   SEQUENCE {
   npdcch-NumRepetitionPaging-r14
                                    ENUMERATED {
                                           r1, r2, r4, r8, r16, r32, r64, r128,
                                            r256, r512, r1024, r2048,
                                           spare4, spare3, spare2, spare1} OPTIONAL, -- Need OP
    pagingWeight-r14
                                           PagingWeight-NB-r14 DEFAULT w1,
}
PagingWeight-NB-r14 ::= ENUMERATED {w1, w2, w3, w4, w5, w6, w7, w8,
                                                w9, w10, w11, w12, w13, w14, w15, w16}
UL-ConfigCommon-NB-r14 ::=
                                   SEQUENCE {
                                     CarrierFreq-NB-r13,
NPRACH-ParametersList-NB-r14 OPTIONAL, -- Need OR
   ul-CarrierFreq-r14
    nprach-ParametersList-r14
    [[ nprach-ParametersListEDT-r15 NPRACH-ParametersList-NB-r14
                                                                       OPTIONAL -- Cond EDT
    11
}
UL-ConfigCommonTDD-NB-r15 ::=
                                   SEQUENCE {
   tdd-UL-DL-AlignmentOffset-r15 TDD-UL-DL-AlignmentOffset-NB-r15, nprach-ParametersListTDD-r15 NPRACH-ParametersListTDD-NB-r15 C
                                       NPRACH-ParametersListTDD-NB-r15 OPTIONAL, -- Need OR
}
NPRACH-ProbabilityAnchorList-NB-r14 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF
                                               NPRACH-ProbabilityAnchor-NB-r14
NPRACH-ProbabilityAnchor-NB-r14 ::=
                                        SEQUENCE {
   nprach-ProbabilityAnchor-r14
                                           ENUMERATED {
                                               zero, oneSixteenth, oneFifteenth, oneFourteenth,
                                                oneThirteenth, oneTwelfth, oneEleventh, oneTenth,
                                                oneNinth, oneEighth, oneSeventh, oneSixth,
                                                oneFifth, oneFourth, oneThird, oneHalf}
                                                        OPTIONAL
                                                                   -- Need OP
}
-- ASN1STOP
```

SystemInformationBlockType2	2-NB field descriptions
dl-CarrierConfig	
For FDD: Provides the configuration of the DL non-anchor carrie	er.
For TDD: Provides the configuration of the non-anchor carrier.	
dl-ConfigList, dl-ConfigListMixed	
For FDD: List of DL non-anchor carriers and associated configu	ation that can be used for paging and/or random
access. E-UTRAN configures DL non-anchor carriers operating	
and only a UE that supports mixed operation mode uses the car	
signalled in the <i>dl</i> -ConfigList or in <i>dl</i> -ConfigListMixed.	
If <i>dl-ConfigListMixed</i> is present and at least one of the carriers in	d Configl ist Mixed is configured for paging:
- If pagingDistribution is present, the UE supporting mixed	
for paging by appending <i>dl-ConfigListMixed</i> to the <i>dl-Cor</i>	
ConfigList and dl-ConfigListMixed; the total number of sig	gnalled DL non-anchor carriers cannot be more than
maxNonAnchorCarriers-NB-r14.	provide upon the list of DL corriers for paging
- If pagingDistribution is absent, the UE supporting mixed of a subject of the support of the su	
provided in <i>dl-ConfigListMixed</i> and considers <i>pagingWei</i>	gntAnchor being set to wu, i.e. the anchor carrier is n
used.	
Otherwise, the <i>pagingDistribution</i> field is not applicable and the	
For TDD: List of non-anchor carriers and associated configuration	on that can be used for paging and/or random access
mixedOperationModeConfig	
For FDD: Provides the configuration of DL and UL non-anchor c	arriers that can be used for paging and random
access by a UE that supports mixed operation mode.	
For TDD: This parameter is absent.	
npdcch-NumRepetitionPaging	
Maximum number of repetitions for NPDCCH common search s	pace (CSS) for paging, see TS 36.213 [23], clause
16.6.	
If the field is absent, the value of npdcch-NumRepetitionPaging	configured in SystemInformationBlockType2-NB in IE
pcch-Config applies.	
nprach-Distribution	
Indicates which UL carriers a UE supporting mixed operation mo	ode uses for random access as defined in description
of ul-ConfigList, ul-ConfigListMixed.	
nprach-ParametersList, nprach-ParametersList-EDT	
Configure NPRACH parameters for each NPRACH resource on	one non-anchor UL carrier. Up to three NPRACH
resources can be configured on one non-anchor UL carrier. Eac	
number of NPRACH repetitions.	
NPRACH resources in <i>nprach-ParametersListEDT</i> are used to i	nitiate EDT. Each NPRACH resource is associated
with a maximum TBS signalled in the corresponding entry of edit	
E-UTRAN includes the same number of entries, and listed in the	
SystemInformationBlockType2-NB.	
nprach-ParametersListTDD	
For TDD: Configure NPRACH parameters for each NPRACH read	source on one non-ancher LIL corrier. Lin to three
NPRACH resources can be configured on one non-anchor UL c	source on one non-anchor of camer. Op to three
	arner. Each NPRACH resource is associated with a
different number of NPRACH repetitions.	enternation (TDD) and listed in the server ender the in
E-UTRAN includes the same number of entries in <i>nprach-Paran</i>	
nprach-ParametersListTDD in SystemInformationBlockType2-N	В
nprach-ProbabilityAnchor	
Configure the selection probability for the anchor carrier NPRAC	
corresponds to a probability of 0, oneSixteenth corresponds to the	ne probability of 1/16, oneFifteenth corresponds to th
probability of 1/15, and so on.	
If the field is absent, the selection probability of the anchor carrie	
All non-anchor carriers NPRACH resources have equal probabil	
f there is no NPRACH resource defined on the anchor carrier for	
(respectively nprach-ParametersListFmt2, nprach-ParametersLi	
gnore the signalled value of nprach-ProbabilityAnchor for this re	petition level for the NPRACH resources defined by
nprach-ParametersList-EDT (respectively nprach-ParametersList	stFmt2, nprach-ParametersListFmt2-EDT).
nprach-ProbabilityAnchorList	
Configures the selection probability for each NPRACH resource	on the anchor carrier.
E-UTRAN includes the same number of entries, and listed in the	
SystemInformationBlockType2-NB.	
pagingDistribution	
Indicates which DL carriers a UE supporting mixed operation mo	de monitors for paging as defined in description of d
	see merillere for paging as demou in description of a
ConfigList, dl-ConfigListMixed.	

paging V Weight c	f the non-anchor paging carrier for uneven paging load distribution across the carriers. Value w1 correspond
	ive weight of 1, w2 corresponds to a relative weight of 2, and so on.
	ng load for a carrier 'i' is equal to w(i)/W where i is equal to 0 for the anchor carrier and equal to the index of
he carri	er in the <i>dl-ConfigList / dl-ConfigListMixed</i> for a non-anchor carrier, W is the sum of the weights of all paging
carriers.	
To avoid <= 1638	correlation between paging carrier and paging occasion, the weights should be assigned such that: nB * W 4.
	VeightAnchor
	f the anchor carrier for uneven paging load distribution across the carriers. Value w1 corresponds to a relativ
	1, w2 corresponds to a relative weight of 2, and so on.
	d is absent, the (default) value of w0 is applied, i.e. the anchor carrier is not used for paging.
pcch-Co	
	e the PCCH parameters for the non-anchor DL carrier.
	DL-AlignmentOffset
	the offset between the UL carrier frequency center with respect to DL carrier frequency center for the non-
anchor c	
ul-Carrie	
	: UL carrier frequency of the non-anchor carrier as defined in TS 36.101 [42], clause 5.7.3F.
	: This field is absent and the uplink carrier frequency is same as the downlink frequency.
	gList, ul-ConfigListMixed
configure supports	: List of UL non-anchor carriers and associated configuration that can be used for random access. E-UTRAN bes UL non-anchor carriers operating in mixed operation mode only in <i>ul-ConfigListMixed</i> and only a UE that mixed operation mode uses the carriers in <i>ul-ConfigListMixed</i> . A given carrier is either signalled in the <i>ul-</i>
	st or in <i>ul-ConfigListMixed</i> .
- If ca a	figListMixed is present and at least one of the carriers in <i>ul-ConfigListMixed</i> is configured for random access: <i>nprach-Distribution</i> is present, the UE supporting mixed operation mode creates a combined list of UL arriers for random access by appending <i>ul-ConfigListMixed</i> to the <i>ul-ConfigList</i> while maintaining the order mong both <i>ul-ConfigList</i> and <i>ul-ConfigListMixed</i> ; the total number of signalled UL non-anchor carriers cannot
	e more than maxNonAnchorCarriers-NB-r14.
а	nprach-Distribution is absent, the UE supporting mixed operation mode uses the list of UL carriers for rando ccess provided in ul-ConfigListMixed and considers nprach-ProbabiliyAnchor being set to zero for each
	PRACH resource, i.e. the anchor carrier is not used for random access.
	e, the nprach-Distribution field is not applicable and the UE shall ignore the value.
	: E-UTRAN configures ul-ConfigList-r15 and includes the same number of entries as in dl-ConfigList. The UL
	equency of the non-anchor carrier is same as the DL carrier frequency.
	nfigPerCarrier
-or FDD	: Carrier specific WUS Configuration.

Conditional presence	Explanation
dl-ConfigList	This field is optionally present, Need OR, if the field <i>dl-ConfigList</i> is present. Otherwise the field is not present.
EDT	The field is optionally present, Need OR, if <i>edt-Parameters</i> in <i>SystemInformationBlockType2-NB</i> is present; otherwise the field is not present and the UE shall delete any existing value for this field.
pcch-config	This field is optionally present, Need OP, if the field <i>dl-ConfigList</i> is present and at least one of the carriers in <i>dl-ConfigList</i> is configured for paging. Otherwise the field is not present and only the anchor carrier is used for paging.
nprach-config	This field is mandatory present, if the field <i>ul-ConfigList</i> is present and at least one of the carriers in <i>ul-ConfigList</i> is configured for random access. Otherwise the field is not present and only the anchor carrier is used for random access.
TDD	This field is optionally present, Need OR, for TDD. Otherwise the field is not present.
ul-ConfigList	This field is optionally present, Need OR, if the field <i>ul-ConfigList</i> is present. Otherwise the field is not present.
WUS	This field is mandatory present, if the field <i>wus-Config</i> is present in <i>SystemInformationBlockType2-NB</i> . Otherwise the field is not present, Need OR.

# SystemInformationBlockType23-NB

_

For FDD, the IE *SystemInformationBlockType23-NB* contains radio resource configuration for NPRACH resources using preamble format 2 on non-anchor carriers.

## SystemInformationBlockType23-NB information element

ASN1START	
<pre>SystemInformationBlockType23-NB-r15 ::=     ul-ConfigList-v1530     ul-ConfigListMixed-v1530     lateNonCriticalExtension  }</pre>	: SEQUENCE { UL-ConfigCommonList-NB-v1530 OPTIONAL, Need OR UL-ConfigCommonList-NB-v1530 OPTIONAL, Need OR OCTET STRING OPTIONAL,
UL-ConfigCommonList-NB-v1530 ::=	SEQUENCE (SIZE (1 maxNonAnchorCarriers-NB-r14)) OF UL-ConfigCommon-NB-v1530
UL-ConfigCommon-NB-v1530 ::= nprach-ParametersListFmt2-r15 nprach-ParametersListFmt2EDT-r15 EDT	SEQUENCE { NPRACH-ParametersListFmt2-NB-r15 OPTIONAL, Need OR NPRACH-ParametersListFmt2-NB-r15 OPTIONAL, Cond
}	
ASN1STOP	

### SystemInformationBlockType23-NB field descriptions

oystemmormationBlockTypezo-ND held descriptions	
nprach-ParametersListFmt2, nprach-ParametersListFmt2EDT	
Configures NPRACH parameters for each NPRACH resource format 2 on one UL carrier. Up to three NPRACH	
resources can be configured on one carrier. Each NPRACH resource is associated with a different number of	
NPRACH repetitions.	
The NPRACH resources in <i>nprach-ParametersListFmt2EDT</i> are used to initiate EDT. Each NPRACH resource is	
associated with a TBS signalled in the corresponding entry of <i>edt-TBS-InfoList</i> .	
E-UTRAN configures the NPRACH resources format 2 so that they do not overlap in time domain with the NPRACH	
resources configured in nprach-ParametersList and nprach-ParametersListEDT on the same UL carrier.	
If there is no NPRACH resource in <i>nprach-ParametersListFmt</i> 2 (respectively <i>nprach-ParametersListFmt</i> 2EDT) on any	
UL carrier, including the anchor carrier, for one NPRACH repetition level, the UE uses the NPRACH resources in	
nprach-ParametersList_(respectively nprach-ParametersListEDT) for this NPRACH repetition level. Otherwise, the UE	
uses only NPRACH resources in nprach-ParametersListFmt2 (respectively nprach-ParametersListFmt2EDT).	
If E-UTRAN configures NPRACH resources format 2 in one NPRACH repetition level, the E-UTRAN configures	
NPRACH resources format 2 in all NPRACH repetition levels upwards.	
ul-ConfigList, ul-ConfigListMixed	
ul-ConfigList (respectively ul-ConfigListMixed) is parallel to ul-ConfigList (respectively ul-ConfigListMixed) in	
SystemInformationBlockType22-NB.	
E-UTRAN includes the same number of entries and in the same order in <i>ul-ConfigList</i> (respectively <i>ul-</i>	
ConfigListMixed) in SystemInformationBlockType23-NB as in ul-ConfigList (respectively ul-ConfigListMixed) in	
SystemInformationBlockType22-NB. The UE combines each entry in ul-ConfigList (respectively ul-ConfigListMixed) in	
SystemInformationBlockType23-NB with the corresponding entry in ul-ConfigList (respectively ul-ConfigListMixed) in	
SystemInformationBlockType22-NB.	

 
 Conditional presence
 Explanation

 EDT
 The field is optionally present, Need OR, if edt-Parameters in SystemInformationBlockType2-NB is present; otherwise the field is not present and the UE shall delete any existing value for this field.

## 6.7.3.2 NB-IoT Radio resource control information elements

## CarrierConfigDedicated-NB

The IE CarrierConfigDedicated-NB is used to specify a carrier in NB-IoT.

## CarrierConfigDedicated-NB information elements

```
-- ASN1START
CarrierConfigDedicated-NB-r13 ::= SEQUENCE {
    dl-CarrierConfig-r13 DL-CarrierConfigDedicated-NB-r13,
    ul-CarrierConfigDedicated-NB-r13 ::= SEQUENCE {
    dl-CarrierFreq-r13 CarrierFreq-NB-r13,
```

```
downlinkBitmapNonAnchor-r13 CHOICE {
                                           NULL,
NULL,
       useNoBitmap-r13
       useAnchorBitmap-r13
       explicitBitmapConfiguration-r13
                                            DL-Bitmap-NB-r13,
       spare
                                             NULL
        OPTIONAL, -- Need ON
                                        CHOICE {
   dl-GapNonAnchor-r13
                                         NULL,
       useNoGap-r13
       useAnchorGapConfig-r13
                                             NULL,
       explicitGapConfiguration-r13
                                             DL-GapConfig-NB-r13,
                                            NULL
       spare
          OPTIONAL, -- Need ON
   inbandCarrierInfo-r13
       andCarrierInfo-r13
samePCI-Indicator-r13
                                          SEQUENCE {
                                          CHOICE {
                                              SEQUENCE {
          samePCI-r13
              indexToMidPRB-r13
                                                    INTEGER (-55..54)
           },
                                              SEQUENCE {
           differentPCI-r13
             eutra-NumCRS-Ports-r13
                                                    ENUMERATED {same, four}
                                 OPTIONAL, -- Cond anchor-guardband-or-standalone
ENUMERATED {n1, n2, n3}
OPTIONAL, -- Cond non-anchor-inband
           }
       }
       eutraControlRegionSize-r13
   }
   [[ nrs-PowerOffsetNonAnchor-v1330 ENUMERATED {dB-12, dB-10, dB-8, dB-6, dB-4, dB-2, dB0, dB3}
                                 OPTIONAL -- Need ON
   ]],
   [[ dl-GapNonAnchor-v1530
                                        DL-GapConfig-NB-v1530 OPTIONAL -- Cond TDD1
   ]],
      dl-CarrierFreq-v1550
                                        CarrierFreq-NB-v1550 OPTIONAL -- Cond TDD1
   [[
   ]]
}
UL-CarrierConfigDedicated-NB-r13 ::= SEQUENCE {
   ul-CarrierFreq-r13 CarrierFreq-NB-r13
                                                    OPTIONAL, -- Need OP
   ...,
[[ tdd-UL-DL-AlignmentOffset-r15 TDD-UL-DL-AlignmentOffset-NB-r15 OPTIONAL
                                                                                              _ _
Cond TDD
  ]]
}
```

```
-- ASN1STOP
```

CarrierConfigDedicated-NB field descriptions	
dl-CarrierConfig	
Downlink carrier used for all unicast transmissions.	
dl-CarrierFreq	
DL carrier frequency. The downlink carrier is not in a E-UTRA PRB which contains E-UTRA PSS/SSS/PBCH.	
dl-GapNonAnchor	
Downlink transmission gap configuration for the anchor/ non-anchor carrier, see TS 36.211 [21], clause 10.2.3.4 E-UTRAN may configure <i>dl-GapNonAnchor-v1530</i> only if <i>dl-GapNonAnchor-r13</i> is set to <i>explicitGapConfiguration</i> (Configuration).	
downlinkBitmapNonAnchor	
For FDD: NB-IoT downlink subframe configuration for downlink transmission on the anchor/ non-anchor carrier.	. See
TS 36.213 [23], clause 16.4.	
For TDD: NB-IoT downlink, uplink and special subframes configuration for transmission on the anchor/ non-anc	chor
carrier. See TS 36.213 [23], clause 16.4.	
eutraControlRegionSize	
Indicates the control region size of the E-UTRA cell for the in-band operation mode, see TS 36.213 [23]. Unit is	
number of OFDM symbols. If operationModeInfo in MIB-NB is set to inband-SamePCI or inband-DifferentPCI, it	t
should be set to the value broadcast in SIB1-NB.	
eutra-NumCRS-Ports	
Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 3	6.211
[21], TS 36.212 [22], and TS 36.213 [23].	
inbandCarrierInfo	
Provides the configuration of the anchor/ non-anchor inband carrier. If operationModeInfo is set to standalone in	n the
MIB-NB, E-UTRAN only configures this field if the UE supports mixed operation mode.	
indexToMidPRB	
The PRB index is signaled by offset from the middle of the EUTRA system.	
nrs-PowerOffsetNonAnchor	
Provides the power offset of the downlink narrowband reference-signal EPRE of the anchor/ non-anchor carrier	
relative to the anchor carrier, unit in dB. Value dB-12 corresponds to -12 dB, dB-10 corresponds to -10 dB and a	so on.
See TS 36.213 [23], clause16.2.2.	
samePCI-Indicator	
This parameter specifies whether the anchor/ non-anchor carrier reuses the same PCI as the EUTRA carrier.	
ul-CarrierConfig	
Uplink anchor/ non-anchor carrier used for all unicast transmissions.	
ul-CarrierFreq	
For FDD: UL carrier frequency as defined in TS 36.101 [42], clause 5.7.3F. If absent, the same TX-RX frequence	су
separation and carrier frequency offset as for the anchor carrier applies.	
For TDD: This field is absent and the uplink carrier frequency is equal to the downlink frequency.	

Conditional presence	Explanation
non-anchor-inband	The field is mandatory present if the anchor/ non-anchor carrier is an inband carrier;
	otherwise it is not present.
anchor-guardband-or-	The field is mandatory present if operationModeInfo is set to guardband or standalone in
standalone	the MIB; otherwise it is not present.
TDD	The field is mandatory present for TDD; otherwise the field is not present and the UE shall
	delete any existing value for this field.
TDD1	The field is optionally present, Need OR, for TDD; otherwise the field is not present and
	the UE shall delete any existing value for this field.

## CarrierFreq-NB

_

The IE CarrierFreq-NB is used to provide the NB-IoT carrier frequency, as defined in TS 36.101 [42].

### CarrierFreq-NB information elements

```
-- ASN1START
CarrierFreq-NB-r13 ::= SEQUENCE {
    carrierFreq-r13 ARFCN-ValueEUTRA-r9,
    carrierFreqOffset-r13 ENUMERATED {
        v-10, v-9, v-8, v-7, v-6, v-5, v-4, v-3, v-2, v-1, v-0dot5,
        v0, v1, v2, v3, v4, v5, v6, v7, v8, v9
        } OPTIONAL -- Need ON
}
CarrierFreq-NB-v1550 ::= SEQUENCE {
    carrierFreqOffset-v1550 ENUMERATED {v-8dot5, v-4dot5, v3dot5, v7dot5}
```

}

-- ASN1STOP

#### CarrierFreq-NB field descriptions

*carrierFreq* Provides the ARFCN applicable for the NB-IoT carrier frequency as defined in TS 36.101 [42], Table 5.7.3-1. *carrierFreqOffset* 

Offset of the NB-IoT channel number to EARFCN as defined in TS 36.101 [42], clause 5.7.3F. Value v-10 means -10, v-9 means -9, and so on. E-UTRAN may configure the values v-8dot5, v-4dot5, v3dot5 and v7dot5 only for a carrier in a TDD band.

For TDD, the UE shall use the value signalled in *carrierFreqOffset-v1550*, if present, and ignore the value signaled in *carrierFreqOffset-r13*.

## ChannelRasterOffset-NB

The IE *ChannelRasterOffset-NB* is used to specify the NB-IoT offset from LTE channel raster. Unit in kHz in set { -7.5, -2.5, 2.5, 7.5} See TS 36.211[21] and TS 36.213 [23].

### ChannelRasterOffset-NB information element

-- ASN1START

ChannelRasterOffset-NB-r13 ::= ENUMERATED {khz-7dot5, khz-2dot5, khz2dot5, khz7dot5}

-- ASN1STOP

## - DL-Bitmap-NB

The IE DL-Bitmap-NB is used to specify the set of NB-IoT downlink subframes for downlink transmission.

#### DL-Bitmap-NB information element

```
-- ASN1START

DL-Bitmap-NB-r13 ::= CHOICE {

subframePattern10-r13 BIT STRING (SIZE (10)),

subframePattern40-r13 BIT STRING (SIZE (40))

}
```

-- ASN1STOP

DL-Bitmap-NB field descriptions

subframePattern10, subframePattern40
For FDD: NB-IoT downlink subframe configuration over 10ms or 40ms for inband and 10ms for standalone/guardband.
For TDD: NB-IoT downlink, uplink and special subframes configuration over 10ms or 40ms for inband and 10ms for standalone/guardband.
The first/leftmost bit corresponds to the subframe #0 of the radio frame satisfying SFN mod x = 0, where x is the size of the bit string divided by 10. Value 0 in the bitmap indicates that the corresponding subframe is invalid for transmission. Value 1 in the bitmap indicates that the corresponding subframe is valid for transmission.

## DL-CarrierConfigCommon-NB

The IE *DL-CarrierConfigCommon-NB is* used to specify the common configuration of a DL non-anchor carrier in NB-IoT.

#### DL-CarrierConfigCommon-NB information elements

-- ASN1START

DL-CarrierConfigCommon-NB-r14 ::= SEOU	JENCE {
dl-CarrierFreg-r14	CarrierFreg-NB-r13,
	CHOICE {
useNoBitmap-r14	NULL,
useAnchorBitmap-r14	NULL,
explicitBitmapConfiguration-r14	,
},	DE DICIMOP NO 113
dl-GapNonAnchor-r14	CHOICE {
useNoGap-r14	NULL,
useAnchorGapConfig-r14	NULL,
explicitGapConfiguration-r14	DL-GapConfig-NB-r13
},	DE Supconité ND 115
inbandCarrierInfo-r14	SEQUENCE {
samePCI-Indicator-r14	CHOICE {
samePCI-r14	SEQUENCE {
indexToMidPRB-r14	INTEGER (-5554)
},	
differentPCI-r14	SEQUENCE {
eutra-NumCRS-Ports-r14	
}	
} OPTIONAL, Cond anch	nor-guardband-or-standalone
eutraControlRegionSize-r14	
} OPTIONAL, Cond non-anch	
	ENUMERATED {dB-12, dB-10, dB-8, dB-6,
	dB-4, dB-2, dB0, dB3} DEFAULT dB0,
,	· · · · · · · · · · · · · · · · · · ·
	DL-GapConfig-NB-v1530 OPTIONAL Cond TDD
11,	
[[ dl-CarrierFreq-v1550	CarrierFreg-NB-v1550 OPTIONAL Cond TDD
]]	• · · · · · · · · · · · · · · · · · · ·
}	
, ,	

-- ASN1STOP

#### DL-CarrierConfigCommon-NB field descriptions

#### dl-CarrierFreq

DL carrier frequency. The downlink carrier is not in a E-UTRA PRB which contains E-UTRA PSS/SSS/PBCH. *dl-GapNonAnchor* 

Downlink transmission gap configuration for the non-anchor carrier, see TS 36.211 [21], clause 10.2.3.4. E-UTRAN may configure *dl-GapNonAnchor-v1530* only if *dl-GapNonAnchor-r14* is set to *explicitGapConfiguration*. *downlinkBitmapNonAnchor* 

# For FDD: NB-IoT downlink subframe configuration for downlink transmission on the non-anchor carrier. See TS

# 36.213 [23], clause 16.4.

For TDD: NB-IoT downlink, uplink and special subframes configuration for transmission on the anchor/ non-anchor carrier. See TS 36.213 [23], clause 16.4.

#### eutraControlRegionSize

Indicates the control region size of the E-UTRA cell for the in-band operation mode, see TS 36.213 [23]. Unit is in number of OFDM symbols. If *operationModeInfo* in MIB-NB is set to *inband-SamePCI* or *inband-DifferentPCI*, it should be set to the value broadcast in SIB1-NB.

### eutra-NumCRS-Ports

Number of E-UTRA CRS antenna ports, either the same number of ports as NRS or 4 antenna ports. See TS 36.211 [21], TS 36.212 [22], and TS 36.213 [23].

## inbandCarrierInfo

Provides the configuration of a non-anchor inband carrier.

#### indexToMidPRB

The PRB index is signaled by offset from the middle of the EUTRA system.

#### nrs-PowerOffsetNonAnchor

Provides the downlink narrowband reference-signal EPRE offset of the non-anchor carrier relative to the downlink narrowband reference-signal EPRE of the anchor carrier, unit in dB. Value dB-12 corresponds to -12 dB, dB-10 corresponds to -10 dB and so on. See TS 36.213 [23], clause 16.2.2.

#### samePCI-Indicator

This parameter specifies whether the non-anchor carrier reuses the same PCI as the EUTRA carrier.

Conditional presence	Explanation
non-anchor-inband	The field is mandatory present if the non-anchor carrier is an inband carrier; otherwise it is
	not present.
anchor-guardband-or-	The field is mandatory present, if operationModeInfo is set to guardband or standalone in
standalone	the MIB; otherwise it is not present.
TDD	The field is optionally present, Need OR, for TDD; otherwise the field is not present and
	the UE shall delete any existing value for this field.

## DL-GapConfig-NB

The IE *DL-GapConfig-NB* is used to specify the downlink gap configuration for NPDCCH and NPDSCH. Downlink gaps apply to all NPDCCH/NPDSCH transmissions except for BCCH.

### DL-GapConfig-NB information element

```
-- ASN1START
DL-GapConfig-NB-r13 ::= SEQUENCE {
    dl-GapThreshold-r13 ENUMERATED {n32, n64, n128, n256},
    dl-GapPeriodicity-r13 ENUMERATED {sf64, sf128, sf256, sf512},
    dl-GapDurationCoeff-r13 ENUMERATED {oneEighth, oneFourth, threeEighth, oneHalf}
}
DL-GapConfig-NB-v1530 ::= SEQUENCE {
    dl-GapPeriodicity-v1530 ENUMERATED {sf1024}
}
```

```
-- ASN1STOP
```

#### DL-GapConfig-NB field descriptions

Coefficient to calculate the gap duration of a DL transmission: dl-GapDurationCoeff * dl-GapPeriodicity, Duration in number of subframes. See TS 36.211 [21], clause 10.2.3.4.

#### dl-GapPeriodicity

dl-GapDurationCoeff

Periodicity of a DL transmission gap in number of subframes. See TS 36.211 [21], clause 10.2.3.4. Value *sf64* corresponds to 64 subframes, value *sf128* corresponds to 128 subframes, value *sf256* corresponds to 256 subframes and so on. E-UTRAN may configure the value *sf64* only in FDD mode and the value *sf1024* only in TDD mode.

The UE shall use the value signalled in *dl-GapPeriodicity-v1530*, if present, and ignore the value signaled in *dl-GapPeriodicity-r13*.

#### dl-GapThreshold

Threshold on the maximum number of repetitions configured for NPDCCH before application of DL transmission gap configuration. See TS 36.211 [21], clause 10.2.3.4.

## LogicalChannelConfig-NB

The IE LogicalChannelConfig-NB is used to configure the logical channel parameters.

### LogicalChannelConfig-NB information element

```
-- ASN1START

LogicalChannelConfig-NB-r13 ::= SEQUENCE {

priority-r13 INTEGER (1..16) OPTIONAL, -- Cond UL

logicalChannelSR-Prohibit-r13 BOOLEAN OPTIONAL, -- Need ON

...

}

-- ASN1STOP
```

LogicalChannelConfig-NB field descriptions	
logicalChannelSR-Prohibit	
Value TRUE indicates that the logicalChannelSR-ProhibitTimer is enabled for the logical channel. If	
logicalChannelSR-Prohibit is configured (i.e. indicates value TRUE), E-UTRAN also configures logicalChannelSR-	
ProhibitTimer. See TS 36.321 [6].	
priority	
Logical channel priority in TS 36.321 [6]. Value is an integer.	

Conditional presence	Explanation
UL	The field is mandatory present for UL logical channels; otherwise it is not present.

## MAC-MainConfig-NB

The IE MAC-MainConfig-NB is used to specify the MAC main configuration for signalling and data radio bearers.

#### MAC-MainConfig-NB information element

```
-- ASN1START
MAC-MainConfig-NB-r13 ::=
                                   SEOUENCE {
                                  SEQUENCE {
    ul-SCH-Config-r13
       periodicBSR-Timer-r13
                                         PeriodicBSR-Timer-NB-r13
                                                                          OPTIONAL, -- Need ON
        retxBSR-Timer-r13
                                           RetxBSR-Timer-NB-r13
                                                                      OPTIONAL,
                                                                                   -- Need ON
    drx-Config-r13
                                       DRX-Config-NB-r13
                                                                       OPTIONAL,
                                                                                   -- Need ON
    drx-Config-r13 DRX-Confi
timeAlignmentTimerDedicated-r13 TimeAlign
logicalChannelSR-Config-r13 CHOICE {
                                        TimeAlignmentTimer,
    logicalChannelSR-Config-r13
        release
                                            NULL,
                                            SEQUENCE {
        setup
            logicalChannelSR-ProhibitTimer-r13 ENUMERATED {
                                                    pp2, pp8, pp32, pp128, pp512,
                                                    pp1024, pp2048, spare}
        }
    }
                                                                       OPTIONAL, -- Need ON
    [[ rai-Activation-r14
                                                ENUMERATED {true}
                                                                           OPTIONAL, -- Need OR
        dataInactivityTimerConfig-r14 CHOICE {
                                                NULL,
           release
            setup
                                                SEQUENCE {
                dataInactivityTimer-r14
                                                   DataInactivityTimer-r14
            }
        }
                                                                        OPTIONAL
                                                                                    -- Need ON
    ]],
       drx-Cycle-v1430
                                        ENUMERATED {
    [[
                                    sf1280, sf2560, sf5120, sf10240} OPTIONAL
                                                                                    -- Need ON
    11,
                                       ENUMERATED {true}
                                                                                    -- Need ON
      ra-CFRA-Config-r14
                                                                        OPTIONAL
    ] ]
    11
}
PeriodicBSR-Timer-NB-r13 ::=
                                    ENUMERATED {
                                       pp2, pp4, pp8, pp16, pp64, pp128, infinity, spare}
RetxBSR-Timer-NB-r13 ::=
                                    ENUMERATED {
                                        pp4, pp16, pp64, pp128, pp256, pp512, infinity, spare}
DRX-Config-NB-r13 ::=
                                    CHOICE {
   release
                                       NULL,
                                        SEQUENCE {
    setup
        onDurationTimer-r13
                                            ENUMERATED {
                                               pp1, pp2, pp3, pp4, pp8, pp16, pp32, spare},
        drx-InactivityTimer-r13
                                            ENUMERATED
                                                pp0, pp1, pp2, pp3, pp4, pp8, pp16, pp32},
                                            ENUMERATED
        drx-RetransmissionTimer-r13
                                                pp0, pp1, pp2, pp4, pp6, pp8, pp16, pp24,
                                                pp33, spare7, spare6, spare5,
                                                spare4, spare3, spare2, spare1},
        drx-Cycle-r13
                                            ENUMERATED {
                                                sf256, sf512, sf1024, sf1536, sf2048, sf3072,
                                                sf4096, sf4608, sf6144, sf7680, sf8192, sf9216,
                                                spare4, spare3, spare2, spare1},
        drx-StartOffset-r13
                                            INTEGER (0..255),
```

	drx-ULRetransmissionTimer-r13	
	drx-ULRetransmissionlimer-ris	- (
		pp0, pp1, pp2, pp4, pp6, pp8, pp16, pp24,
		pp33, pp40, pp64, pp80, pp96,
		pp112, pp128, pp160, pp320}
	1	PP112, PP120, PP100, PP520]
	}	
}		

-- ASN1STOP

MAC-MainConfig-NB field descriptions		
drx-Config		
Used to configure DRX as specified in TS 36.321 [6].		
<i>drx-Cycle</i> longDRX-Cycle in TS 36.321 [6]. The value of longDRX-Cycle is in number of sub-frames. Value sf256 corresponds to 256 sub-frames, sf512 corresponds to 512 sub-frames and so on. In case <i>drx-Cycle-v1430</i> is signalled, the UE shall ignore <i>drx-Cycle-r13</i> .		
drx-StartOffset		
drxStartOffset in TS 36.321 [6]. Value is in number of sub-frames by step of (drx-cycle / 256).		
drx-InactivityTimer		
Timer for DRX in TS 36.321 [6]. Value in number of PDCCH periods. Value pp0 corresponds to 0 PDCCH period and behaviour as specified in 7.3.2 applies, pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on.		
drx-RetransmissionTimer		
Timer for DRX in TS 36.321 [6]. Value in number of PDCCH periods. Value pp0 corresponds to 0 PDCCH period and behaviour as specified in 7.3.2 applies, pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on.		
drx-ULRetransmissionTimer		
Timer for DRX in TS 36.321 [6].		
Value in number of PDCCH periods. Value pp0 corresponds to 0 PDCCH period and behaviour as specified in 7.3.2 applies, value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on.		
logicalChannelSR-ProhibitTimer		
Timer used to delay the transmission of an SR. See TS 36.321 [6]. Value in number of PDCCH periods. Value pp2 corresponds to 2 PDCCH periods, pp8 corresponds to 8 PDCCH periods and so on.		
periodicBSR-Timer		
Timer for BSR reporting in TS 36.321 [6]. Value in number of PDCCH periods. Value pp2 corresponds to 2 PDCCH periods, pp4 corresponds to 4 PDCCH periods and so on.		
ra-CFRA-Config		
Activation of contention free random access (CFRA), see TS 36.321 [6].		
rai-Activation		
Activation of release assistance indication (RAI) in TS 36.321 [6].		
retxBSR-Timer		
Timer for BSR reporting in TS 36.321 [6]. Value in number of PDCCH periods. Value pp4 corresponds to 4 PDCCH periods, pp16 corresponds to 16 PDCCH periods and so on.		
onDurationTimer		
Timer for DRX in TS 36.321 [6]. Value in number of PDCCH periods. Value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on.		
timeAlignmentTimer		
Indicates the value of the time alignment timer, see TS 36.321 [6].		

# NPDCCH-ConfigDedicated-NB

The IE NPDCCH-ConfigDedicated-NB specifies the subframes and resource blocks for NPDCCH monitoring.

## NPDCCH-ConfigDedicated-NB information element

-- ASN1START

NPDCCH-ConfigDedicated-NB-r13 ::=	SEQUENCE {
npdcch-NumRepetitions-r13	ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,
	r256, r512, r1024, r2048,
	<pre>spare4, spare3, spare2, spare1},</pre>
npdcch-StartSF-USS-r13	ENUMERATED {v1dot5, v2, v4, v8, v16, v32, v48, v64},
npdcch-Offset-USS-r13	ENUMERATED {zero, oneEighth, oneFourth, threeEighth}
}	

```
NPDCCH-ConfigDedicated-NB-v1530 ::= SEQUENCE {
    npdcch-StartSF-USS-v1530 ENUMERATED {v96, v128}
}
```

-- ASN1STOP

#### NPDCCH-ConfigDedicated-NB field descriptions

#### npdcch-NumRepetitions

Maximum number of repetitions for NPDCCH UE specific search space (USS), see TS 36.213 [23], clause 16.6. UE monitors one set of values (consisting of aggregation level, number of repetitions and number of blind decodes) according to the configured maximum number of repetitions.

#### npdcch-Offset-USS

Fractional period offset of starting subframe for NPDCCH UE specific search space (USS), see TS 36.213 [23], clause 16.6.

### npdcch-StartSF-USS

nrs-Power

Starting subframe configuration for an NPDCCH UE-specific search space, see TS 36.213 [23], clause 16.6. Value v1dot5 corresponds to 1.5, value 2 corresponds to 2 and so on. E-UTRAN may configure values v1dot5 and v2 only in FDD mode and values v96 and v128 only in TDD mode.

The UE shall use the value signalled in *npdcch-StartSF-USS-v1530*, if present, and ignore the value signalled in *npdcch-StartSF-USS-r13*.

## – NPDSCH-ConfigCommon-NB

The IE NPDSCH-ConfigCommon-NB is used to specify the common NPDSCH configuration.

#### NPDSCH-ConfigCommon-NB information element

```
-- ASN1START
NPDSCH-ConfigCommon-NB-r13 ::= SEQUENCE {
    nrs-Power-r13 INTEGER (-60..50)
}
-- ASN1STOP
```

NPDSCH-ConfigCommon-NB field descriptions

Provides the downlink narrowband reference-signal EPRE, see TS 36.213 [23], clause 16.2. The actual value in dBm.

## NPRACH-ConfigSIB-NB

The IE NPRACH-ConfigSIB-NB is used to specify the NPRACH configuration for the anchor and non-anchor carriers.

### NPRACH-ConfigSIB-NB information elements

ASN1START	
NPRACH-ConfigSIB-NB-r13 ::= nprach-CP-Length-r13 rsrp-ThresholdsPrachInfoList-r1	SEQUENCE { ENUMERATED {us66dot7, us266dot7}, .3 RSRP-ThresholdsNPRACH-InfoList-NB-r13 OPTIONAL, Need
OR nprach-ParametersList-r13 }	NPRACH-ParametersList-NB-r13
NPRACH-ConfigSIB-NB-v1330 ::= nprach-ParametersList-v1330 }	SEQUENCE { NPRACH-ParametersList-NB-v1330
NPRACH-ConfigSIB-NB-v1450 ::= maxNumPreambleAttemptCE-r14 }	SEQUENCE { ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1}
NPRACH-ConfigSIB-NB-v1530 ::= tdd-Parameters-r15 nprach-PreambleFormat-r15	SEQUENCE { SEQUENCE { ENUMERATED {

fmt0, fmt1, fmt2, fmt0-a, fmt1-a}, ENUMERATED { dummy n1, n2, n4, n8, n16, n32, n64, n128, n256, n512, n1024}, nprach-ParametersListTDD-r15 NPRACH-ParametersListTDD-NB-r15 } OPTIONAL, -- Cond TDD fmt2-Parameters-r15 SEQUENCE { NPRACH-ParametersListFmt2-NB-r15 OPTIONAL, -- Need OR nprach-ParametersListFmt2-r15 nprach-ParametersListFmt2EDT-r15 NPRACH-ParametersListFmt2-NB-r15 OPTIONAL -- Cond EDT2 OPTIONAL, -- Need OR edt-Parameters-r15 SEQUENCE { edt-SmallTBS-Subset-r15 ENUMERATED {true} OPTIONAL. -- Need OR edt-TBS-InfoList-r15 EDT-TBS-InfoList-NB-r15, nprach-ParametersListEDT-r15 NPRACH-ParametersList-NB-r14 OPTIONAL -- Need OR } OPTIONAL -- Cond EDT1 } NPRACH-ConfigSIB-NB-v1550 ::= SEQUENCE { tdd-Parameters-v1550 SEQUENCE { nprach-ParametersListTDD-v1550 NPRACH-ParametersListTDD-NB-v1550 } NPRACH-ParametersList-NB-r13 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-r13 NPRACH-ParametersList-NB-v1330 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-Parameters-NB-v1330 NPRACH-Parameters-NB-r13::= SEOUENCE { nprach-Periodicity-r13 ENUMERATED {ms40, ms80, ms160, ms240, ms320, ms640, ms1280, ms2560}, nprach-StartTime-r13 ENUMERATED {ms8, ms16, ms32, ms64, ms128, ms256, ms512, ms1024}, nprach-SubcarrierOffset-r13 ENUMERATED {n0, n12, n24, n36, n2, n18, n34, spare1}, nprach-NumSubcarriers-r13 ENUMERATED {n12, n24, n36, n48}, nprach-SubcarrierMSG3-RangeStart-r13 ENUMERATED {zero, oneThird, twoThird, one}, maxNumPreambleAttemptCE-r13ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1},numRepetitionsPerPreambleAttempt-r13ENUMERATED {n1, n2, n4, n8, n16, n32, n64, n128}, npdcch-NumRepetitions-RA-r13 ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, r256, r512, r1024, r2048, spare4, spare3, spare2, spare1}, npdcch-StartSF-CSS-RA-r13 ENUMERATED {vldot5, v2, v4, v8, v16, v32, v48, v64}, npdcch-Offset-RA-r13 ENUMERATED {zero, oneEighth, oneFourth, threeEighth} } NPRACH-Parameters-NB-v1330 ::= SEQUENCE { nprach-NumCBRA-StartSubcarriers-r13 ENUMERATED {n8, n10, n11, n12, n20, n22, n23, n24, n32, n34, n35, n36, n40, n44, n46, n48} } SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-ParametersList-NB-r14 ::= NPRACH-Parameters-NB-r14 SEQUENCE { NPRACH-Parameters-NB-r14 ::= nprach-Parameters-r14 SEQUENCE { nprach-Periodicity-r14 ENUMERATED {ms40, ms80, ms160, ms240, ms320, ms640, ms1280, ms2560} OPTIONAL, -- NEED OP ENUMERATED {ms8, ms16, ms32, ms64, nprach-StartTime-r14 ms128, ms256, ms512, ms1024} OPTIONAL, -- NEED OP ENUMERATED {n0, n12, n24, n36, n2, n18, n34, spare1} nprach-SubcarrierOffset-r14 OPTIONAL, -- NEED OP ENUMERATED  $\{n12, n24, n36, n48\}$ nprach-NumSubcarriers-r14 OPTIONAL, -- NEED OP nprach-SubcarrierMSG3-RangeStart-r14 ENUMERATED {zero, oneThird, twoThird, one} OPTIONAL, -- NEED OP ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128, npdcch-NumRepetitions-RA-r14 r256, r512, r1024, r2048, spare4, spare3, spare2, spare1} OPTIONAL, -- NEED OP ENUMERATED {vldot5, v2, v4, v8, v16, v32, v48, v64} OPTIONAL, -- NEED OP npdcch-StartSF-CSS-RA-r14 npdcch-Offset-RA-r14 ENUMERATED {zero, oneEighth, oneFourth, threeEighth} OPTIONAL, -- NEED OP nprach-NumCBRA-StartSubcarriers-r14 ENUMERATED {n8, n10, n11, n12, n20, n22, n23, n24, n32, n34, n35, n36, n40, n44, n46, n48}

```
OPTIONAL, -- NEED OP
                                                  INTEGER (1..maxNonAnchorCarriers-NB-r14)
        npdcch-CarrierIndex-r14
                                                     OPTIONAL, -- Need OP
        OPTIONAL -- Need OR
    }
}
NPRACH-ParametersListTDD-NB-r15 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF
                                             NPRACH-ParametersTDD-NB-r15
NPRACH-ParametersTDD-NB-r15 ::=
                                    SEQUENCE {
    nprach-Parameters-r15
                                             SEQUENCE {
                                                  ENUMERATED {ms80, ms160, ms320, ms640,
        nprach-Periodicity-r15
                                                              ms1280, ms2560, ms5120, ms10240}
                                                      OPTIONAL,
                                                                  -- NEED OP
                                                  ENUMERATED {ms10, ms20, ms40, ms80,
        nprach-StartTime-r15
                                                              ms160, ms320, ms640, ms1280,
                                                              ms2560, ms5120, spare6, spare5,
                                                              spare4, spare3, spare2, spare1}
                                                      OPTIONAL,
                                                                 -- NEED OP
        nprach-SubcarrierOffset-r15
                                                  ENUMERATED {n0, n12, n24, n36, n2, n18, n34, spare1}
                                                      OPTIONAL, -- NEED OP
        nprach-NumSubcarriers-r15
                                                  ENUMERATED {n12, n24, n36, n48}
                                                     OPTIONAL, -- NEED OP
        nprach-SubcarrierMSG3-RangeStart-r15
                                                  ENUMERATED {zero, oneThird, twoThird, one}
                                                     OPTIONAL, -- NEED OP
        npdcch-NumRepetitions-RA-r15
                                                  ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,
                                                              r256, r512, r1024, r2048,
                                                              spare4, spare3, spare2, spare1}
                                                  OPTIONAL, -- NEED OP
ENUMERATED {v4, v8, v16, v32, v48, v64, v96, v128}
        npdcch-StartSF-CSS-RA-r15
                                                          OPTIONAL, -- NEED OP
        npdcch-Offset-RA-r15
                                                  ENUMERATED {zero, oneEighth, oneFourth, threeEighth}
                                                    OPTIONAL, -- NEED OP
                                                  ENUMERATED {n8, n10, n11, n12, n20, n22, n23, n24,
        nprach-NumCBRA-StartSubcarriers-r15
                                                              n32, n34, n35, n36, n40, n44, n46, n48}
                                                     OPTIONAL, -- NEED OP
        OPTIONAL -- Need OR
    }
}
NPRACH-ParametersListTDD-NB-v1550 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF
                                                 NPRACH-ParametersTDD-NB-v1550
NPRACH-ParametersTDD-NB-v1550 ::= SEQUENCE {
maxNumPreambleAttemptCE-v1550 EN
                                            ENUMERATED {n3, n4, n5, n6, n7, n8, n10, spare1},
    \texttt{numRepetitionsPerPreambleAttempt-v1550} \quad \texttt{ENUMERATED} \ \left\{\texttt{n1}, \ \texttt{n2}, \ \texttt{n4}, \ \texttt{n8}, \ \texttt{n16}, \ \texttt{n32}, \ \texttt{n64}, \ \texttt{n128}, \right. \\
                                                               n256, n512, n1024}
}
NPRACH-ParametersListFmt2-NB-r15 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF NPRACH-
ParametersFmt2-NB-r15
NPRACH-ParametersFmt2-NB-r15 ::=
                                       SEQUENCE {
   nprach-Parameters-r15
                                             SEQUENCE {
        nprach-Periodicity-r15
                                                  ENUMERATED {ms40, ms80, ms160, ms320,
                                                              ms640, ms1280, ms2560, ms5120}
                                                      OPTIONAL, -- NEED OP
                                                  ENUMERATED {ms8, ms16, ms32, ms64,
        nprach-StartTime-r15
                                                              ms128, ms256, ms512, ms1024}
                                                      OPTIONAL, -- NEED OP
        nprach-SubcarrierOffset-r15
                                                  ENUMERATED {n0, n36, n72, n108, n6, n54, n102, n42,
                                                              n78, n90, n12, n24, n48, n84, n60, n18}
                                                      OPTIONAL,
                                                                  -- NEED OP
                                                  ENUMERATED {n36, n72, n108, n144}
        nprach-NumSubcarriers-r15
                                                     OPTIONAL, -- NEED OP
                                                  ENUMERATED {zero, oneThird, twoThird, one}
        nprach-SubcarrierMSG3-RangeStart-r15
                                                     OPTIONAL, -- NEED OP
                                                  ENUMERATED {r1, r2, r4, r8, r16, r32, r64, r128,
        npdcch-NumRepetitions-RA-r15
                                                              r256, r512, r1024, r2048,
                                                              spare4, spare3, spare2, spare1}
                                                     OPTIONAL,
                                                                 -- NEED OP
        npdcch-StartSF-CSS-RA-r15
                                                  ENUMERATED {vldot5, v2, v4, v8, v16, v32, v48, v64}
                                                         OPTIONAL, -- NEED OP
        npdcch-Offset-RA-r15
                                                  ENUMERATED {zero, oneEighth, oneFourth, threeEighth}
                                                      OPTIONAL,
                                                                  -- NEED OP
        nprach-NumCBRA-StartSubcarriers-r15
                                                  ENUMERATED {
                                                     n24, n30, n33, n36, n60, n66, n69, n72,
```

n96, n102, n105, n108, n120, n132, n138, n144} OPTIONAL, -- NEED OP INTEGER (1..maxNonAnchorCarriers-NB-r14) npdcch-CarrierIndex-r15 OPTIONAL, -- Need OP . . . OPTIONAL -- Need OR } } RSRP-ThresholdsNPRACH-InfoList-NB-r13 ::= SEQUENCE (SIZE(1..2)) OF RSRP-Range EDT-TBS-InfoList-NB-r15 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF EDT-TBS-NB-r15 EDT-TBS-NB-r15 ::= SEQUENCE { edt-SmallTBS-Enabled-r15 BOOLEAN, edt-TBS-r15 ENUMERATED {b328, b408, b504, b584, b680, b808, b936, b1000} } -- ASN1STOP

NPRACH-ConfigSIB-NB field descriptions	
<i>dummy</i> This field is not used in the specification. If received it shall be ignored by the UE.	
edt-SmallTBS-Enabled	
Value TRUE indicates UE performing EDT is allowed to select TBS smaller than <i>edt-TBS</i> for	Msg3 according to the
corresponding NPRACH resource, as specified in TS 36.213 [23].	
edt-SmallTBS-Subset	
Presence indicates only two of the TBS values can be used according to edt-TBS correspond	
resource, as specified in TS 36.213 [23]. When the field is not present, any of the TBS values corresponding to the NPRACH resource can be used. This field is applicable for a NPRACH r	
SmallTBS-Enabled is included for the corresponding NPRACH resource.	resource only when eur-
edt-TBS	
Largest TBS for Msg3 for a NPRACH resource applicable to a UE performing EDT. Value in t	bits. Value b328
corresponds to 328 bits, value b408 corresponds to 408 bits and so on. See TS 36.213 [23].	
maxNumPreambleAttemptCE	
Maximum number of preamble transmission attempts per NPRACH resource. See TS 36.321	
If the UE supports enhanced random access power control and maxNumPreambleAttemptCE	E-r14 is included, the UE
shall use maxNumPreambleAttemptCE-r14 instead of maxNumPreambleAttemptCE-r13 for the	he first entry in nprach-
ParametersList.	
maxNumPreambleAttemptCE-r13 applies to FDD and maxNumPreambleAttemptCE-v1550 a	pplies to TDD.
<i>npdcch-CarrierIndex</i> For FDD: Index of the carrier in the list of DL non anchor carriers. The first entry in the list has	a index '1' the second
entry has index '2' and so on.	
If the UE supports mixed operation mode and <i>dl-ConfigListMixed</i> is present in systemInforma	tionBlockType22-NB
the UE creates a combined list of DL carriers for random access by appending <i>dl-ConfigListI</i>	
while maintaining the order among both <i>dl-ConfigList</i> and <i>dl-ConfigListMixed</i> ; only the first ma	
NB-r14 DL non-anchor carriers in the concatenated list can be used for random access.	
If the field is absent in the entry in nprach-ParametersListEDT in SystemInformationBlockTyp	
npdcch-CarrierIndex in the corresponding entry of nprach-ParametersList applies, if present.	
entry in nprach-ParametersListFmt2EDT in SystemInformationBlockType23-NB, the value of	
the corresponding entry of <i>nprach-ParametersListFmt2</i> applies, if present. Otherwise, the DL	anchor carrier is used.
For TDD: This parameter is absent and the same carrier is used in uplink and downlink.	
<i>npdcch-NumRepetitions-RA</i> Maximum number of repetitions for NPDCCH common search space (CSS) for RAR, Msg3 re	atransmission and Meg/
see TS 36.213 [23], clause 16.6.	-11 41151111551011 4110 191594,
See NOTE.	
npdcch-Offset -RA	
Fractional period offset of starting subframe for NPDCCH common search space (CSS Type	2), see TS 36.213 [23],
clause 16.6.	
See NOTE.	
npdcch-StartSF-CSS-RA	
Starting subframe configuration for NPDCCH common search space (CSS), including RAR, M	Asg3 retransmission, and
Msg4, see TS 36.213 [23], clause 16.6. See NOTE.	
nprach-CP-Length	
Cyclic prefix length for NPRACH transmission (T _{CP} ), see TS 36.211 [21], clause 10.1.6. Value	e us66dot7 corresponds
to 66.7 microseconds and value us266dot7 corresponds to 266.7 microseconds. If the UE us	
for preamble format 2, the UE ignores the value signalled in nprach-CP-Length and considers	
microseconds.	
nprach-NumCBRA-StartSubcarriers	
The number of start subcarriers from which a UE can randomly select a start subcarrier as sp	
If nprach-Config-v1330 is not included in SystemInformationBlockType2-NB, the UE sets the	
NumCBRA-StartSubcarriers-r13 to the value signalled by nprach-NumSubcarriers-r13 for the	corresponding NPRACH
resource. The start subcarrier indices that the UE is allowed to randomly select from, are given by:	
nprach-SubcarrierOffset + [0, nprach-NumCBRA-StartSubcarriers - 1].	
See NOTE.	
nprach-NumSubcarriers	
Number of sub-carriers in a NPRACH resource, see TS 36.211 [21], clause 10.1.6. In numbe	r of subcarriers.
See NOTE.	
nprach-ParametersList, nprach-ParametersListEDT	
Configures NPRACH parameters for each NPRACH resource. Up to three PRACH resources	
nprach-ParametersList in a cell. Each NPRACH resource is associated with a different number	er of NPRACH
The NPRACH resources in <i>nprach-ParametersListEDT</i> are used to initiate EDT. Each NPRAC	CH resource is
associated with a TBS signalled in the corresponding entry of <i>edt-TBS-InfoList</i> .	
For TDD: The UE shall use <i>nprach-ParametersListTDD</i> and ignore <i>nprach-ParametersList</i> .	

NPRACH-ConfigSIB-NB field descriptions prach-ParametersListTDD or TDD: Configure NPRACH parameters for each NPRACH. Up to three NPRACH resources can be	e configured in a
ell. Each NPRACH resource is associated with a different number of NPRACH repetitions.	e configured in a
prach-ParametersListFmt2, nprach-ParametersListFmt2EDT configures NPRACH parameters for each NPRACH resource format 2. Up to three NPRACH resource onfigured on one carrier. Each NPRACH resource is associated with a different number of NPRACH he NPRACH resources in nprach-ParametersListFmt2EDT are used to initiate EDT. Each NPRACH ssociated with a TBS signalled in the corresponding entry of edt-TBS-InfoList. -UTRAN configures the NPRACH resources format 2 so that they do not overlap in time domain wit esources configured in nprach-ParametersList and nprach-ParametersListEDT. there is no NPRACH resource in nprach-ParametersListFmt2 (respectively nprach-ParametersListI L carrier for one NPRACH repetition level, the UE uses the NPRACH resources in nprach-ParametersListEDT) esources in nprach-ParametersListEDT) for this NPRACH repetition level. Otherwise, the UE uses of esources in nprach-ParametersListFmt2 (respectively nprach-ParametersListFmt2EDT).	I repetitions. I resource is th the NPRACH <i>Fmt2EDT</i> ) on any rersList
<i>prach-Periodicity</i> eriodicity of a NPRACH resource, see TS 36.211 [21], clause10.1.6. Unit in millisecond. ee NOTE.	
prach-PreambleFormat	
DD: TDD preamble format, see TS 36.211 [21]. clause 10.1.6,	
alue <i>fmt0</i> corresponds to preamble format 0, value <i>fmt1</i> corresponds to preamble format 1 and so c	on.
<i>prach-StartTime</i> tart time of the NPRACH resource in one period, see TS 36.211 [21], clause 10.1.6. Unit in millisecc ee NOTE.	ond.
prach-SubcarrierOffset	
requency location of the NPRACH resource, see TS 36.211 [21], clause 10.1.6. In number of subca	rriers, offset fror
ub-carrier 0. ee NOTE.	
prach-SubcarrierMSG3-RangeStart	
raction for calculating the starting subcarrier index of the range reserved for indication of UE suppor lsg3 transmission, within the NPRACH resource, see TS 36.211 [21], clause 10.1.6. Multi-tone Msg ot supported for {32, 64, 128} repetitions of NPRACH. For at least one of the NPRACH resources w IPRACH repetitions other than {32, 64, 128}, the value of <i>nprach-SubcarrierMSG3-RangeStart</i> shou <i>nprach-SubcarrierMSG3-RangeStart</i> is equal to zero, no start subcarrier index for the single-tone M llocated and the start subcarrier indexes for the multi-tone Msg3 NPRACH partition are given by <i>npr</i> <i>cubcarrierOffset</i> + [0, <i>nprach-NumCBRA-StartSubcarriers</i> - 1]. <i>nprach-SubcarrierMSG3-RangeStart</i> is equal to oneThird or twoThird, the start subcarrier indexes f artitions are given by:	3 transmission is ith the number o Ild not be 0. /Isg3 NPRACH is rach-
prach-SubcarrierOffset + [0, floor(nprach-NumCBRA-StartSubcarriers * nprach-SubcarrierMSG3-Ra or the single-tone Msg3 NPRACH partition;	
prach-SubcarrierOffset + [floor(nprach-NumCBRA-StartSubcarriers * nprach-SubcarrierMSG3-Rang lumCBRA-StartSubcarriers - 1]	geStart), nprach-
or the multi-tone Msg3 NPRACH partition; nprach-SubcarrierMSG3-RangeStart is equal to one, the start subcarrier indexes for the single-tone re given by nprach-SubcarrierOffset + [0, nprach-NumCBRA-StartSubcarriers - 1] and no start subcarrier ne multi-tone Msg3 NPRACH partition is allocated. ee NOTE.	
umRepetitionsPerPreambleAttempt lumber of NPRACH repetitions per attempt for each NPRACH resource, See TS 36.211 [21], clause umRepetitionsPerPreambleAttempt-r13 applies to FDD and numRepetitionsPerPreambleAttempt-v DD.	
srp-ThresholdsPrachInfoList he criterion for UEs to select a NPRACH resource. Up to 2 RSRP threshold values can be signalled lement corresponds to RSRP threshold 1, the second element corresponds to RSRP threshold 2. So absent, there is only one NPRACH resource.	ee TS 36.321 [6
UE that supports <i>powerClassNB-14dBm-r14</i> shall correct the RSRP threshold values before applyi ollows:	-
SRP threshold = Signalled RSRP threshold - min{0, (14-min(23, P-Max))} where P-Max is the value systemInformationBlockType1-NB.	e of <i>p-Max</i> field i

- If the field is absent in an entry of *nprach-ParametersList* in *SystemInformationBlockType22-NB*, the value of the same field in the corresponding entry of *nprach-ParametersList_*in *SystemInformationBlockType2-NB* applies.

- If the field is absent in the entry in *nprach-ParametersListEDT*, the value of the same field in the corresponding entry of *nprach-ParametersList* on the same UL carrier applies, if present. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.
- If the field is absent in an entry of *nprach-ParametersListTDD* in *SystemInformationBlockType22-NB*, the value of the same field in the corresponding entry of *nprach-ParametersListTDD* in *SystemInformationBlockType2-NB* applies. The field is mandatory present in *nprach-ParametersListTDD* in *SystemInformationBlockType2-NB*.
- If the field is absent in an entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType23-NB*, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB* applies. Otherwise the value of the same field, if present, in the corresponding entry of the first occurence of *nprach-ParametersListFmt2* in the non anchor carrier list applies. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB* applies.
- If the field is absent in an entry of *nprach-ParametersListFmt2EDT* in *SystemInformationBlockType23-NB*, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* on the same UL carrier applies. Otherwise, the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* in *SystemInformationBlockType2-NB* applies. Otherwise the value of the same field, if present, in the corresponding entry of *nprach-ParametersListFmt2* in the non anchor carrier list applies. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersListFmt2* in the non anchor carrier list applies. Otherwise, the value of the same field in the corresponding entry of *nprach-ParametersList* in *SystemInformationBlockType2-NB* applies.

Conditional presence	Explanation
EDT1	The field is mandatory present if <i>cp-EDT</i> or <i>up-EDT</i> in <i>SystemInformationBlockType2-NB</i> is present; otherwise the field is not present and the UE shall delete any existing value for
	this field.
EDT2	The field is optionally present, Need OR, if edt-Parameters is present; otherwise the field
	is not present and the UE shall delete any existing value for this field.
TDD	This field is mandatory present for TDD; otherwise the field is not present and the UE
	shall delete any existing value for this field.

## NPUSCH-Config-NB

The IE *NPUSCH-ConfigCommon-NB* is used to specify the common NPUSCH configuration. The IE *NPUSCH-ConfigDedicated-NB* is used to specify the UE specific NPUSCH configuration.

## NPUSCH-Config-NB information element

ASN1START			
NPUSCH-ConfigCommon-NB-r13 ::= SE(	OUENCE {		
ack-NACK-NumRepetitions-Msg4-r13		H-Resources-NB-	r13)) OF
	ACK-NACK-Nu	mRepetitions-NB	-r13,
srs-SubframeConfig-r13	ENUMERATED {		
	sc0, sc1, sc2, sc3, sc4	, sc5, sc6, sc7	,
	sc8, sc9, sc10, sc11, s	c12, sc13, sc14	, sc15
	}	OPTIONAL,	Need OR
dmrs-Config-r13	SEQUENCE {		
threeTone-BaseSequence-r13	INTEGER (012)	OPTIONAL,	Need OP
threeTone-CyclicShift-r13	INTEGER (02),		
sixTone-BaseSequence-r13	INTEGER (014)	OPTIONAL,	Need OP
sixTone-CyclicShift-r13	INTEGER (03),		
twelveTone-BaseSequence-r13	INTEGER (030)	OPTIONAL	Need OP
} OPTIONAL, Need OR			
ul-ReferenceSignalsNPUSCH-r13	UL-ReferenceSignalsNPUSCH-N	B-r13	
}			
UL-ReferenceSignalsNPUSCH-NB-r13 ::=	SEQUENCE {		
groupHoppingEnabled-r13	BOOLEAN,		
groupAssignmentNPUSCH-r13	INTEGER (029)		
}			
NPUSCH-ConfigDedicated-NB-r13 ::= SE(	OUENCE {		
ack-NACK-NumRepetitions-r13	ACK-NACK-NumRepetitions-NB-	r13 ODTTONAL	Need ON
npusch-AllSymbols-r13	BOOLEAN	OPTIONAL,	Cond SRS
		,	20110 0110

groupHoppingDisabled-r13 }	ENUMERATED {true}	OPTIONAL Need OR
ACK-NACK-NumRepetitions-NB-r13	::= ENUMERATED {r1, r2, r4, r8, r	r16, r32, r64, r128}

-- ASN1STOP

NPUSCH-Config-NB field descriptions

ack-NACK-NumRepetitions	
Number of repetitions for the ACK NACK resource unit carrying HARQ response to NPDSCH, s	see TS 36.213 [23],
clause 16.4.2. If this field is absent and no value was configured via dedicated signalling, the va	alue used for reception
of Msg4 is used.	·
ack-NACK-NumRepetitions-Msg4	
Number of repetitions for ACK/NACK HARQ response to NPDSCH containing Msg4 per NPRA	CH resource, see TS
36.213 [23], clause 16.4.2.	
groupAssignmentNPUSCH	
See TS 36.211 [21], clause 10.1.4.1.3.	
groupHoppingDisabled	
See TS 36.211 [21], clause 10.1.4.1.3.	
groupHoppingEnabled	
See TS 36.211 [21], clause 10.1.4.1.3.	
npusch-AllSymbols	
If set to TRUE, the UE shall use all NB-IoT symbols for NPUSCH transmission. If set to FALSE,	, the UE punctures th
NPUSCH transmissions in the symbols that collides with SRS. If the field is not present, the UE	uses all NB-IoT
symbols for NPUSCH transmission. See TS 36.211 [21], clause 10.1.3.6.	
sixTone-BaseSequence	
The base sequence of DMRS sequence in a cell for 6 tones transmission; see TS 36.211 [21], of	clause 10.1.4.1.2. If
absent, it is given by NB-IoT CellID mod 14. Value 14 is not used.	
sixTone-CyclicShift	
Define 4 cyclic shifts for the 6-tone case, see TS 36.211 [21], clause 10.1.4.1.2.	
srs-SubframeConfig	
SRS SubframeConfiguration. See TS 36.211 [21], table 5.5.3.3-1. Value sc0 corresponds to val	lue 0, sc1 to value 1
and so on.	
threeTone-BaseSequence	
The base sequence of DMRS sequence in a cell for 3 tones transmission; see TS 36.211 [21], of	clause 10.1.4.1.2. If
absent, it is given by NB-IoT CellID mod 12. Value 12 is not used.	
threeTone-CyclicShift	
Define 3 cyclic shifts for the 3-tone case, see TS 36.211 [21], clause 10.1.4.1.2.	
twelveTone-BaseSequence	
The base sequence of DMRS sequence in a cell for 12 tones transmission; see TS 36.211 [21],	, clause 10.1.4.1.2. If
absent, it is given by NB-IoT CellID mod 30. Value 30 is not used.	
ul-ReferenceSignalsNPUSCH	
Used to specify parameters needed for the transmission on NPUSCH.	

Conditional presence	Explanation
SRS	This field is optionally present, need OP, if srs-SubframeConfig is broadcasted.
	Otherwise, the IE is not present.

# PDCP-Config-NB

The IE *PDCP-Config-NB* is used to set the configurable PDCP parameters for data radio bearers.

## PDCP-Config-NB information element

ASN1START		
PDCP-Config-NB-r13 ::=	SEQUENCE {	
discardTimer-r13	ENUMERATED {	
	ms5120, ms10240, ms20480, m	ns40960,
	ms81920, infinity, spare2,	sparel
	} OPTIONAL,	Cond Setup
headerCompression-r13	CHOICE {	
notUsed	NULL,	
rohc	SEQUENCE {	
maxCID-r13	INTEGER (116383)	DEFAULT 15,

	profiles-r13	SEQUENCE {
	profile0x0002	BOOLEAN,
	profile0x0003	BOOLEAN,
	profile0x0004	BOOLEAN,
	profile0x0006	BOOLEAN,
	profile0x0102	BOOLEAN,
	profile0x0103	BOOLEAN,
	profile0x0104	BOOLEAN
	},	
}		
},		
• • •		
}		
ASN1STOP		

#### PDCP-Config-NB field descriptions

#### discardTimer

Indicates the discard timer value specified in TS 36.323 [8]. Value in milliseconds. Value ms5120 means 5120 ms, ms10240 means 10240 ms and so on.

### headerCompression

E-UTRAN does not reconfigure header compression except optionally upon RRC Connection Resumption. *maxCID* 

Indicates the value of the MAX_CID parameter as specified in TS 36.323 [8]. The total value of MAX_CIDs across all bearers for the UE should be less than or equal to the value of *maxNumberROHC-ContextSessions* parameter as indicated by the UE.

#### profiles

The profiles used by both compressor and decompressor in both UE and E-UTRAN. The field indicates which of the ROHC profiles specified in TS 36.323 [8] are supported, i.e. value *true* indicates that the profile is supported. Profile 0x0000 shall always be supported when the use of ROHC is configured. If support of two ROHC profile identifiers with the same 8 LSB's is signalled, only the profile corresponding to the highest value shall be applied.

Conditional presence	Explanation
Setup	The field is mandatory present in case of radio bearer setup. Otherwise the field is optionally present, need ON.

## PhysicalConfigDedicated-NB

The IE PhysicalConfigDedicated-NB is used to specify the UE specific physical channel configuration.

#### PhysicalConfigDedicated-NB information element

#### -- ASN1START PhysicalConfigDedicated-NB-r13 ::= SEQUENCE { carrierConfigDedicated-r13 npdcch-ConfigDedicated-r13 npusch-ConfigDedicated-r13 NPUSCH-ConfigDedicated-NB-r13 NPUSCH-ConfigDedicated-NB-r13 NPUSCH-ConfigDedicated-NB-r13 OPTIONAL, -- Need ON NPDCCH-ConfigDedicated-NB-r13 NPUSCH-ConfigDedicated-NB-r13 OPTIONAL, -- Need ON OPTIONAL, -- Need ON uplinkPowerControlDedicated-r13 UplinkPowerControlDedicated-r13 OPTIONAL, -- Need ON ENUMERATED {true} OPTIONAL 11 twoHARQ-ProcessesConfig-r14 -- Need OR ]], [[ interferenceRandomisationConfig-r14 ENUMERATED {true} OPTIONAL -- Need OR ]], [[ npdcch-ConfigDedicated-v1530 NPDCCH-ConfigDedicated-NB-v1530 OPTIONAL -- Cond TDD 11, ]] additionalTxSIB1-Config-v1540 ENUMERATED {true} OPTIONAL -- Cond additionalSIB1 ]] 1 -- ASN1STOP

PhysicalConfigDedicated-NB field descriptions
carrierConfigDedicated
Anchor/ non-anchor carrier used for all unicast transmissions.
interferenceRandomisationConfig
For FDD: Interference randomisation enabled in connected mode, except for random access procedure in connected
mode, see TS 36.211 [21]. For random access in connected mode interference randomisation on non-anchor is used
and is not used on anchor carrier, see TS 36.211 [21].
For TDD: the parameter is not present.
npdcch-ConfigDedicated
NPDCCH configuration.
npusch-ConfigDedicated
UL unicast configuration.
twoHARQ-ProcessesConfig
Activation of two HARQ processes, see TS 36.212 [22] and TS 36.213 [23].
uplink-PowerControlDedicated
UL power control parameter.
additionalTxSIB1-Config
Indicates if subframe #3 not containing additional SIB1 transmission is a NB-IoT DL subframe, as specified in TS
36.213 [23], clause 16.4.

Conditional presence	Explanation
TDD	The field is optionally present, Need OR, for TDD; otherwise the field is not present and
	the UE shall delete any existing value for this field.
additionalSIB1	This field is optionally present, Need OR, if additionalTransmissionSIB1 is set to TRUE in
	MasterInformationBlock-NB; otherwise it is not present.

## RACH-ConfigCommon-NB

-- ASN1START

The IE RACH-ConfigCommon-NB is used to specify the generic random access parameters.

## RACH-ConfigCommon-NB information element

```
RACH-ConfigCommon-NB-r13 ::= SEQUENCE {
	preambleTransMax-CE-r13 PreambleTransMax,
	powerRampingParameters-r13 PowerRampingParameters,
                                       RACH-InfoList-NB-r13,
    rach-InfoList-r13
    connEstFailOffset-r13
                                         INTEGER (0..15)
                                                                         OPTIONAL, -- Need OP
    [[ powerRampingParameters-v1450 PowerRampingParameters-NB-v1450 OPTIONAL
                                                                                       -- Need OR
    11.
    [[ rach-InfoList-v1530
                                       RACH-InfoList-NB-v1530 OPTIONAL -- Cond EDT
    ]]
}
RACH-InfoList-NB-r13 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-r13
RACH-InfoList-NB-v1530 ::= SEQUENCE (SIZE (1.. maxNPRACH-Resources-NB-r13)) OF RACH-Info-NB-v1530
RACH-Info-NB-r13
                    ::=
                            SEQUENCE {
                                        ENUMERATED {
   ra-ResponseWindowSize-r13
                                             pp2, pp3, pp4, pp5, pp6, pp7, pp8, pp10},
    mac-ContentionResolutionTimer-r13 ENUMERATED {
                                            pp1, pp2, pp3, pp4, pp8, pp16, pp32, pp64}
}
RACH-Info-NB-v1530 ::=
                          SEQUENCE {
   mac-ContentionResolutionTimer-r15
                                        ENUMERATED {
                                             pp1, pp2, pp3, pp4, pp8, pp16, pp32, pp64}
}
PowerRampingParameters-NB-v1450 ::=
                                        SEQUENCE {
                                                      ENUMERATED {
   preambleInitialReceivedTargetPower-v1450
                                                      dBm-130, dBm-128, dBm-126, dBm-124, dBm-122,
                                                      dBm-88, dBm-86, dBm-84, dBm-82, dBm-80}
                                                      OPTIONAL, -- Need OR
    powerRampingParametersCE1-r14
                                                 SEQUENCE {
                                                     ENUMERATED {dB0, dB2, dB4, dB6},
        powerRampingStepCE1-r14
        preambleInitialReceivedTargetPowerCE1-r14 ENUMERATED {
```

	dBm-130, dBm-128, dBm-126, dBm-124, dBm-122,
	dBm-120, dBm-118, dBm-116, dBm-114, dBm-112,
	dBm-110, dBm-108, dBm-106, dBm-104, dBm-102,
	dBm-100, dBm-98, dBm-96, dBm-94, dBm-92,
	dBm-90, dBm-88, dBm-86, dBm-84, dBm-82, dBm-80}
} OPTIONAL Need OR	
}	
·	

-- ASN1STOP

#### RACH-ConfigCommon-NB field descriptions

36.304 [4]. If the field is not present the value of infinity shall be used for "Qoffsettemp".

	connEstFailOffset
	Parameter "Qoffsettemp" in TS
mac-ContentionResolution	

*mac-ContentionResolutionTimer* Timer for contention resolution in TS 36.321 [6]. Value in PDCCH periods. Value pp1 corresponds to 1 PDCCH period, pp2 corresponds to 2 PDCCH periods and so on. *mac-ContentionResolutionTimer-r15* is only applicable for EDT. UE performing EDT shall use *mac-ContentionResolutionTimer-r15*, if present.

For FDD: The value considered by the UE is: *mac-ContentionResolutionTimer* = Min (signaled value x PDCCH period, 10.24s).

For TDD: The value considered by the UE is: *mac-ContentionResolutionTimer* = Min (signaled value x PDCCH period, 20.48s).

#### powerRampingParameters, powerRampingParametersCE1

Power ramping step and preamble initial received target power – same as TS 36.213 [23] and TS 36.321 [6]. For FDD, if the UE does not support enhanced random access power control and more than one repetition level is configured in the cell, then the UE transmits NPRACH with max power except for the lowest repetition level. Otherwise, the UE uses NPRACH power ramping.

For FDD, if the UE supports enhanced random access power control and *powerRampingParameters-v1450* is signalled, or for TDD, the UE uses NPRACH power ramping across repetition levels as specified in TS 36.321 [6]. If *preambleInitialReceivedTargetPower-v1450* is present, the UE shall use *preambleInitialReceivedTargetPower-v1450* instead of *preambleInitialReceivedTargetPower-v1450* is present, the UE shall use *powerRampingParametersCE1* is present, the UE shall use *powerRampingParametersCE1* is present, the UE shall use *powerRampingParametersCE1* instead of *powerRampingParameters* for NPRACH power ramping in the second repetition level.

#### preambleTransMax-CE

Maximum number of preamble transmission in TS 36.321 [6]. Value is an integer.

#### ra-ResponseWindowSize

Duration of the RA response window in TS 36.321 [6]. Value in PDCCH periods. Value pp2 corresponds to 2 PDDCH periods, pp3 corresponds to 3 PDCCH periods and so on.

For FDD: The value considered by the UE is: *ra-ResponseWindowSize* = Min (signaled value x PDCCH period, 10.24s).

For TDD: The value considered by the UE is: *ra-ResponseWindowSize* = Min (signaled value x PDCCH period, 20.48s).

Conditional presence	Explanation
EDT	The field is optionally present, Need OR, if edt-Parameters is present; otherwise the field
	is not present and the UE shall delete any existing value for this field.

## RadioResourceConfigCommonSIB-NB

The IE *RadioResourceConfigCommonSIB-NB* is used to specify common radio resource configurations in the system information, e.g., the random access parameters and the static physical layer parameters.

## RadioResourceConfigCommonSIB-NB information element

ASNISIARI			
RadioResourceConfigCommonSIB-NB-r13	::= SEQUENCE {		
rach-ConfigCommon-r13	RACH-ConfigCommon-NB-r13,		
bcch-Config-r13	BCCH-Config-NB-r13,		
pcch-Config-r13	PCCH-Config-NB-r13,		
nprach-Config-r13	NPRACH-ConfigSIB-NB-r13,		
npdsch-ConfigCommon-r13	NPDSCH-ConfigCommon-NB-r13	,	
npusch-ConfigCommon-r13	NPUSCH-ConfigCommon-NB-r13	,	
dl-Gap-r13	DL-GapConfig-NB-r13	OPTIONAL,	Need OP
uplinkPowerControlCommon-r13	UplinkPowerControlCommon-NI	3-r13,	
· · · · /			
[[ nprach-Config-v1330	NPRACH-ConfigSIB-NB-v1330	OPTIONAL	Need OR
]],			

[[ nprach-Config-v1450 EnhPowerControl	NPRACH-ConfigSIB-NB-v1450	OPTIONAL	Cond
<pre>]], [[ nprach-Config-v1530     dl-Gap-v1530     wus-Config-r15 ]],</pre>	NPRACH-ConfigSIB-NB-v1530 DL-GapConfig-NB-v1530 WUS-Config-NB-r15	OPTIONAL, OPTIONAL, OPTIONAL	Need OR Cond TDD Need OR
<pre>[[ nprach-Config-v1550 ]] }</pre>	NPRACH-ConfigSIB-NB-v1550	OPTIONAL	Cond TDD1
<pre>BCCH-Config-NB-r13 ::= modificationPeriodCoeff-r13 }</pre>	SEQUENCE { ENUMERATED {n16, n32, n64,	n128}	
PCCH-Config-NB-r13 ::= defaultPagingCycle-r13 nB-r13	SEQUENCE { ENUMERATED {rf128, rf256, n ENUMERATED { fourT, twoT, oneT, half one16thT, one32ndT, one one128thT, one256thT, o spare3, spare2, spare1	ET, quarterT e64thT, one512thT, or	, one8thT,
npdcch-NumRepetitionPaging-r13	ENUMERATED { r1, r2, r4, r8, r16, r2 r256, r512, r1024, r204 spare4, spare3, spare2,	32, r64, r128 48,	8,

-- ASN1STOP

#### RadioResourceConfigCommonSIB-NB field descriptions

#### defaultPagingCycle

Default paging cycle, used to derive 'T' in TS 36.304 [4]. Value rf128 corresponds to 128 radio frames, rf256 corresponds to 256 radio frames and so on.

### dl-Gap

Downlink transmission gap configuration for the anchor carrier. See TS 36.211 [21], clause 10.2.3.4. If the field is absent, there is no gap.

#### *modificationPeriodCoeff*

Actual modification period, expressed in number of radio frames= *modificationPeriodCoeff* * *defaultPagingCycle*. n16 corresponds to value 16, n32 corresponds to value 32, and so on. The BCCH modification period should be larger or equal to 40.96s.

#### nВ

Parameter: nB is used as one of parameters to derive the Paging Frame and Paging Occasion according to TS 36.304 [4]. Value in multiples of 'T' as defined in TS 36.304 [4]. A value of fourT corresponds to 4 * T, a value of twoT corresponds to 2 * T and so on.

#### npdcch-NumRepetitionPaging

Maximum number of repetitions for NPDCCH common search space (CSS) for paging, see TS 36.213 [23], clause 16.6. wus-Config

For FDD: WUS Configuration.

Conditional presence	Explanation
EnhPowerControl	This field is optional present, Need OR, if PowerRampingParameters-NB-v1450 is
	included in SIB2-NB. Otherwise the field is not present.
TDD	The field is optionally present, Need OR, for TDD; otherwise the field is not present and
	the UE shall delete any existing value for this field.
TDD1	The field is mandatory present for TDD; otherwise the field is not present and the UE shall
	delete any existing value for this field.

## RadioResourceConfigDedicated-NB

The IE *RadioResourceConfigDedicated-NB* is used to setup/modify/release RBs, to modify the MAC main configuration, and to modify dedicated physical configuration.

### RadioResourceConfigDedicated-NB information element

-- ASN1START

RadioResourceConfigDedicated-NB-r13 srb-ToAddModList-r13 drb-ToAddModList-r13	::= SEQUENCE { SRB-TOAddModList-NB-r13 DRB-TOAddModList-NB-r13	OPTIONAL, OPTIONAL,	
drb-ToReleaseList-r13	DRB-TOReleaseList-NB-r13		
mac-MainConfig-r13	CHOICE {	,	
explicitValue-r13	MAC-MainConfig-NB-r1	.3,	
defaultValue-r13 }	NULL		Need ON
<pre>} physicalConfigDedicated-r13</pre>	PhysicalConfigDedicated-	OPTIONAL, NB-r13 OPTIONAL,	
rlf-TimersAndConstants-r13	RLF-TimersAndConstants-N		
, [[ schedulingRequestConfig-r15 ]]	SchedulingRequestConfig-	NB-r15 OPTIONAL	Need ON
}			
SRB-ToAddModList-NB-r13 ::=	SEQUENCE (SIZE (1)) OF SRB-TOAdd	Mod-NB-r13	
SRB-ToAddMod-NB-r13 ::=	SEQUENCE {		
rlc-Config-r13	CHOICE {		
explicitValue defaultValue	RLC-Config-NB-r13,		
<pre>&gt; OPTIONAL,</pre>	NULL	Co	nd Setup
logicalChannelConfig-r13	CHOICE {		
explicitValue	LogicalChannelConfig-NB-	r13,	
defaultValue } OPTIONAL,	NULL	Co	nd Setup
,		60	na becap
[[ rlc-Config-v1430	RLC-Config-NB-v1430	OPTIONAL Ne	ed ON
]]			
}			
DRB-ToAddModList-NB-r13 ::=	SEQUENCE (SIZE (1maxDRB-NB-r13	)) OF DRB-ToAddMo	d-NB-r13
DRB-ToAddMod-NB-r13 ::=	SEQUENCE {		
eps-BearerIdentity-r13	INTEGER (015)	OPTIONAL, Co	nd DRB-Setup
drb-Identity-r13 pdcp-Config-r13	DRB-Identity, PDCP-Config-NB-r13	OPTIONAL, Co	nd Setup
rlc-Config-r13	RLC-Config-NB-r13		nd Setup
logicalChannelIdentity-r13	INTEGER (310)		nd DRB-Setup
logicalChannelConfig-r13	LogicalChannelConfig-NB-r13	OPTIONAL, Co	nd Setup
, [[ rlc-Config-v1430 ]]	RLC-Config-NB-v1430	OPTIONAL Ne	ed ON
}			
	GEOLIENCE (GIZE (1		
DRB-ToReleaseList-NB-r13 ::=	SEQUENCE (SIZE (1maxDRB-NB-r13	)) OF DEB-Identit	У

-- ASN1STOP

RadioResourceConfigDedicated-NB field descriptions

logicalChannelConfig		
For SRB a choice is used to indicate whether the logical channel configuration is signalled explicitly or set to the		
default logical channel configuration for SRB1 as specified in 9.2.1.1.		
logicalChannelldentity		
The logical channel identity for both UL and DL for a DRB. Value 3 is not used.		
mac-MainConfig		
The default MAC MAIN configuration is specified in 9.2.2.		
physicalConfigDedicated		
The default dedicated physical configuration is specified in 9.2.4.		
rlc-Config		
For SRBs a choice is used to indicate whether the RLC configuration is signalled explicitly or set to the values defined		
in the default RLC configuration for SRB1 in 9.2.1.1. RLC AM is the only applicable RLC mode for SRB1 and		
SRB1bis.		
schedulingRequestConfig		
For EDD. Schooluling request configuration		

For FDD: Scheduling request configuration.

Conditional presence	Explanation
DRB-Setup	The field is mandatory present if the corresponding DRB is being set up; otherwise it is
	not present.
Setup	The field is mandatory present if the corresponding SRB/DRB is being setup; otherwise
	the field is optionally present, need ON.

## RLC-Config-NB

The IE RLC-Config-NB is used to specify the RLC configuration of SRBs and DRBs.

## **RLC-Config-NB** information element

```
-- ASN1START
RLC-Config-NB-r13 ::= CHOICE {
      ul-AM-RLC-r13
dl-AM-RLC-r13
   am
                      UL-AM-RLC-NB-r13,
DL-AM-RLC-NB-r13
   },
   um-Bi-Directional-r15
                         NULL,
   um-Uni-Directional-UL-r15
                          NULL.
                         NULL
   um-Uni-Directional-DL-r15
}
RLC-Config-NB-v1430 ::= SEQUENCE {
   t-Reordering-r14
                         T-Reordering OPTIONAL
                                                       -- Cond twoHARO
}
}
DL-AM-RLC-NB-r13 ::= SEQUENCE {
                             ENUMERATED {true} OPTIONAL
   enableStatusReportSN-Gap-r13
}
T-PollRetransmit-NB-r13 ::= ENUMERATED {
                          ms250, ms500, ms1000, ms2000, ms3000, ms4000,
                          ms6000, ms10000, ms15000, ms25000, ms40000, ms60000,
                          ms90000, ms120000, ms180000, ms300000-v1530}
```

-- ASN1STOP

#### RLC-Config-NB field descriptions

 enableStatusReportSN-Gap

 Indicates that status reporting due to detection of reception failure is enabled, as specified in TS 36.322 [7].

 maxRetxThreshold

 Parameter for RLC AM in TS 36.322 [7]. Value t1 corresponds to 1 retransmission, t2 to 2 retransmissions and so on.

 t-PollRetransmit

 Timer for RLC AM in TS 36.322 [7], in milliseconds. Value msX means X ms, msY means Y ms and so on.

 E-UTRAN may configure the value msX-v1530 (with suffix) only in TDD mode.

 t-Reordering

 Timer for reordering in TS 36.322 [7], in milliseconds.

Conditional presence	Explanation	
twoHARQ	The field is mandatory present if twoHARQ-ProcessesConfig is set to TRUE. Otherwise,	
	the field is not present and, if previously configured, the timer is released.	

## RLF-TimersAndConstants-NB

The IE *RLF-TimersAndConstants-NB* contains UE specific timers and constants applicable for UEs in RRC_CONNECTED.

```
-- ASN1START
RLF-TimersAndConstants-NB-r13 ::= CHOICE {
   release
                                        NULL,
                                        SEOUENCE {
   setup
        t301-r13
                                            ENUMERATED {
                                                ms2500, ms4000, ms6000, ms10000,
                                                ms15000, ms25000, ms40000, ms60000},
       t310-r13
                                           ENUMERATED {
                                               ms0, ms200, ms500, ms1000, ms2000, ms4000, ms8000},
       n310-r13
                                            ENUMERATED {
                                               n1, n2, n3, n4, n6, n8, n10, n20},
                                            ENUMERATED {
        t311-r13
                                               ms1000, ms3000, ms5000, ms10000, ms15000,
                                                ms20000, ms30000},
        n311-r13
                                            ENUMERATED {
                                               n1, n2, n3, n4, n5, n6, n8, n10},
        [[ t311-v1350
                                            ENUMERATED {
                                              ms40000, ms60000, ms90000, ms120000}
                                                        OPTIONAL -- Need OR
        ]],
[[ t301-v1530
                                            ENUMERATED {
                                             ms80000, ms100000, ms120000}
                                                       OPTIONAL, -- Cond TDD
           t311-v1530
                                            ENUMERATED {
                                               ms160000, ms200000}
                                                                   -- Cond TDD
                                                        OPTIONAL
        ]]
    }
}
-- ASN1STOP
```

#### RLF-TimersAndConstants-NB information element

n3xy Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on. t3xy
t3xy
•
Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms200 corresponds with 200 ms and so on.
The UE shall use the extended values <i>t311-v1350</i> , <i>t301-v1530</i> and <i>t311-v1530</i> , if present, and ignore the value
signaled by <i>t311-r13</i> , <i>t301-r13</i> and <i>t311-r13</i> respectively.

Conditional presence	Explanation
TDD	The field is optionally present, Need OR, in TDD mode. Otherwise, the field is not
	present.

## SchedulingRequestConfig-NB

-- ASN1START

The IE SchedulingRequestConfig-NB is used to specify the Scheduling Request related parameters.

### SchedulingRequestConfig-NB information element

```
SchedulingRequestConfig-NB-r15 ::= SEQUENCE {
   sr-WithHARQ-ACK-Config-r15
sr-WithoutHARQ-ACK-Config-r15
SR-WithoutHARQ-ACK-Config-r15
                                        SR-WithoutHARQ-ACK-Config-NB-r15 OPTIONAL, -- Need
ON
                                      SR-SPS-BSR-Config-NB-r15 OPTIONAL, -- Need ON
   sr-SPS-BSR-Config-r15
    . . .
}
SR-WithoutHARQ-ACK-Config-NB-r15 ::= CHOICE {
   release
                                      NULT.
                                      SEQUENCE {
   setup
       sr-ProhibitTimer-r15
                                          INTEGER (0..7) OPTIONAL,
                                                                      -- Need ON
       sr-NPRACH-Resource-r15
                                          SR-NPRACH-Resource-NB-r15 OPTIONAL -- Need ON
```

}	
}	
<pre>SR-NPRACH-Resource-NB-r15 ::= SEQ nprach-CarrierIndex-r15 nprach-ResourceIndex-r15 nprach-SubCarrierIndex-r15 nprach-Fmt0Fmt1-r15 }, p0-SR-r15 alpha-r15</pre>	<pre>UENCE {    INTEGER (0maxNonAnchorCarriers-NB-r14),    INTEGER (1maxNPRACH-Resources-NB-r13),    CHOICE {       INTEGER (047),       INTEGER (0143)    INTEGER (-12624),    ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1}}</pre>
<pre>SR-SPS-BSR-Config-NB-r15 ::= CHOICE   release   setup     semiPersistSchedC-RNTI-r15     semiPersistSchedIntervalUL-r15   } }</pre>	{ NULL, SEQUENCE { C-RNTI, ENUMERATED {sf128, sf256, sf512, sf1024, sf1280, sf2048, sf2560, sf5120}

-- ASN1STOP

SchedulingRequestConfig-NB field descriptions
Ipha
Parameter: $\alpha_c$ . Fractional power control parameter for SR without HARQ-ACK. See TS 36.213 [23], clause 16.2.1.2.1
where value all corresponds to 0, value al04 corresponds to 0.4, value al05 to 0.5, value al06 to 0.6, value al07 to
1.7, value al08 to 0.8, value al09 to 0.9 and value al1 corresponds to 1.
prach-CarrierIndex
ndex of the carrier in the list of UL non anchor carriers in SystemInformationBlockType22-NB. The first entry in the list
as index '1', the second entry has index '2' and so on. Value '0' indicates the anchor carrier.
prach-ResourceIndex
ndex of the NPRACH resource in the list of NPRACH resources in NPRACH-ParametersList or NPRACH-
ParametersList-Fmt2 for the UL carrier indicated by nprach-CarrierIndex. The first entry in the list has index '1', the
econd entry has index '2' and so on.
-UTRAN configures a NPRACH resource in NPRACH-ParametersList-Fmt2 only to UEs that have reported support
f NPRACH resource Format2.
nprach-SubCarrierIndex
ndex of the subcarrier in the NPRACH resource in NPRACH-ParametersList or or NPRACH-ParametersList-Fmt2 fo
ne indicated UL carrier.
-UTRAN does not configure nprach-SubcarrierIndex to a smaller value than nprach-SubcarrierOffset + nprach-
JumCBRA-StartSubcarriers for the indicated NPRACH resource.
00-SR
D
Parameter: ^P o_ ^{SR,c}
semiPersistSchedC-RNTI
Semi-persistent Scheduling C-RNTI, see TS 36.321 [6].
semiPersistSchedIntervalUL
Semi-persistent scheduling interval in uplink, see TS 36.321 [6]. Value in number of sub-frames. Value sf128
orresponds to 128 sub-frames, value sf256 corresponds to 256 sub-frames and so on.
r-SPS-BSR-Config
Activation of SR with SPS BSR, see TS 36.321 [6].
-UTRAN cannot configure sr-SPS-BSR together with sr-WithoutHARQ-ACK-Config.
r-NPRACH-Resource
IPRACH resource for physical layer SR without HARQ-ACK, see TS 36.211 [21] and TS 36.213 [23].
r-ProhibitTimer
imer for SR transmission on the NPRACH resource for SR in TS 36.321 [6]. Value in number of SR period, where
he SR period is equal to the field nprach-Periodicity of the NPRACH resource. Value 0 means that behaviour as
pecified in 7.3.2 applies. Value 1 corresponds to one SR period, Value 2 corresponds to 2*SR period and so on.
r-WithHARQ-ACK-Config
Activation of physical layer SR with HARQ ACK, see TS 36.213 [23].
r-WithoutHARQ-ACK-Config
Activation of physical layer SR without HARQ ACK, see TS 36.211 [21] and TS 36.213 [23].
-UTRAN cannot configure sr-WithoutHARQ-ACK-Config together with sr-SPS-BSR.

## TDD-Config-NB

The IE *TDD-Config-NB* is used to specify the TDD specific physical channel configuration.

#### **TDD-Config** information element

```
-- ASN1START

TDD-Config-NB-r15 ::= SEQUENCE {

subframeAssignment-r15 ENUMERATED {

specialSubframePatterns-r15 ENUMERATED {

ssp0, ssp1, ssp2, ssp3, ssp4, ssp5, ssp6, ssp7,

ssp8, ssp9, ssp10, ssp10-CRS-LessDwPTS}

-- ASN1STOP
```

#### **TDD-Config** field descriptions

specialSubframePatterns Indicates Configuration as in TS 36.211 [21], table 4.2-1 where ssp0 points to Configuration 0, ssp1 to Configuration 1 etc. Value ssp10-CRS-LessDwPTS corresponds to ssp10 without CRS transmission on the 5th symbol of DwPTS. subframeAssignment Indicates DL/UL subframe configuration where sa1 points to Configuration1, sa2 to Configuration 2 and so on, as specified in TS 36.211 [21], table 4.2-2.

E-UTRAN configures the same value for serving cells residing on same frequency band.

## TDD-UL-DL-AlignmentOffset-NB

The IE *TDD-UL-DL-AlignmentOffset-NB* is used to specify the offset between the UL carrier frequency center with respect to DL carrier frequency center. This information should be used to calculate the Mul value, see TS 36.101 [42].

#### TDD-UL-DL-AlignmentOffset-NB information element

ASN1START			
TDD-UL-DL-AlignmentOffset-NB-r15 ::=	ENUMERATED {	khz-7dot5, khz0,	khz7dot5}
ASN1STOP			

## – UplinkPowerControl-NB

The IE *UplinkPowerControlCommon-NB* and IE *UplinkPowerControlDedicated-NB* are used to specify parameters for uplink power control in the system information and in the dedicated signalling, respectively.

#### UplinkPowerControl-NB information elements

```
-- ASN1START
UplinkPowerControlCommon-NB-r13 ::= SEQUENCE {
    p0-NominalNPUSCH-r13 INTEGER (-126..24),
    alpha-r13 ENUMERATED {al0, al04, al05, al06, al07, al08, al09, al1},
    deltaPreambleMsg3-r13 INTEGER (-1..6)
}
UplinkPowerControlDedicated-NB-r13 ::= SEQUENCE {
    p0-UE-NPUSCH-r13 INTEGER (-8..7)
}
-- ASN1STOP
```

UplinkPowerControl-NB field descriptions
alpha
Parameter: $\alpha_c(1)$ . See TS 36.213 [23], clause 16.2.1.1, where all corresponds to 0, all corresponds to value 0.4,
al05 to 0.5, al06 to 0.6, al07 to 0.7, al08 to 0.8, al09 to 0.9 and al1 corresponds to 1.
deltaPreambleMsg3
Parameter: $\Delta_{PREAMBLE - Msg^3}$ . See TS 36.213 [23], clause 16.2.1.1. Actual value = IE value * 2 [dB].
p0-NominalNPUSCH
Parameter: Po_NOMINAL_NPUSCH,c (1). See TS 36.213 [23], clause 16.2.1.1, unit dBm.
p0-UE-NPUSCH
Parameter: $P_{O_{UE_NPUSCH,c}}$ (1). See TS 36.213 [23], clause 16.2.1.1, unit dB.

_

## WUS-Config-NB

The IE *WUS-Config-NB* is used to specify the WUS configuration. For UEs supporting WUS, E-UTRAN uses WUS to indicate that the UE shall attempt to receive paging in that cell, see TS 36.304 [4].

#### WUS-Config-NB information element

## WUS-Config-NB field descriptions

## maxDurationFactor

Maximum WUS duration, expressed as a ratio of Rmax for Type 1-CSS. Value *one128th* means Rmax * 1/128, value *one64th* means Rmax * 1/64 and so on.

The value  $L_{NWUS_max}$  in TS 36.213 [23] considered by the UE is : maxDuration = Max (signalled value * Rmax, 1) where Rmax is the value of *npdcch-NumRepetitionPaging* for the carrier.

#### numDRX-CyclesRelaxed

Maximum number of consecutive DRX cycles during which the UE may use WUS for synchronisation and skip serving cell measurements, see TS 36.133 [16]. Value n1 corresponds to 1 DRX cycle, value n2 corresponds to 2 DRX cycles and so on.

#### numPOs

Number of consecutive Paging Occasions (PO) mapped to one Wake Up Signal (WUS), applicable to UEs configured to use extended DRX, see TS 36.304 [4]. Value n1 corresponds to 1 PO and value n2 corresponds to 2 POs and so

#### on. timeOffsetDRX

When DRX is used, non-zero gap from the end of the configured maximum WUS duration to the associated PO, see TS 36.304 [4], clause 7.4 and TS 36.211 [21]. In milliseconds. Value *ms40* corresponds to 40ms, value *ms80* corresponds to 80 ms and so on.

#### timeOffset-eDRX-Short

When eDRX is used, the short non-zero gap from the end of the configured maximum WUS duration to the associated PO, see TS 36.304 [4], clause 7.4 and TS 36.211 [21]. In milliseconds. Value *ms40* corresponds to 40ms, value *ms80* corresponds to 80 ms and so on.

E-UTRAN configures *timeOffset-eDRX-Short* to a value longer than or equal to *timeOffsetDRX*.

#### timeOffset-eDRX-Long

When eDRX is used, the long non-zero gap from the end of the configured maximum WUS duration to the associated PO, see TS 36.304 [4], clause 7.4 and TS 36.211 [21]. In milliseconds. Value *ms1000* corresponds to 1000 ms, value *ms2000* corresponds to 2000 ms.

6.7.3.3 NB-IoT Security control information elements

Void

## 6.7.3.4 NB-IoT Mobility control information elements

AdditionalBandInfoList-NB

### AdditionalBandInfoList-NB information element

-- ASN1START

```
AdditionalBandInfoList-NB-r14 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF FreqBandIndicator-NB-r13
```

## FreqBandIndicator-NB

The IE FreqBandIndicator-NB indicates the E-UTRA operating band as defined in TS 36.101 [42], table 5.5-1.

### FreqBandIndicator-NB information element

```
-- ASN1START
FreqBandIndicator-NB-r13 ::= INTEGER (1.. maxFBI2)
-- ASN1STOP
```

## - MultiBandInfoList-NB

## MultiBandInfoList-NB information element

-- ASN1START

```
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```

```
MultiBandInfoList-NB-r13 ::= SEQUENCE (SIZE (1..maxMultiBands)) OF MultiBandInfo-NB-r13
MultiBandInfo-NB-r13 ::= SEQUENCE {
    freqBandIndicator-r13 FreqBandIndicator-NB-r13 OPTIONAL, -- Need OR
    freqBandInfo-r13 NS-PmaxList-NB-r13 OPTIONAL -- Need OR
}
-- ASN1STOP
```

NS-PmaxList-NB

The IE NS-PmaxList-NB concerns a list of additionalPmax and additionalSpectrumEmission as defined in TS 36.101 [42], clause 6.2.4F, for a given frequency band. E-UTRAN does not include the same value of additionalSpectrumEmission in SystemInformationBlockType2-NB within this list.

### NS-PmaxList-NB information element

ReselectionThreshold-NB

The IE *ReselectionThreshold-NB* is used to indicate an Rx level threshold for cell reselection. Actual value of threshold = field value * 2 [dB].

#### ReselectionThreshold-NB information element

```
-- ASN1START
ReselectionThreshold-NB-v1360 ::= INTEGER (32..63)
-- ASN1STOP
```

– T-Reselection-NB

The IE T-Reselection-NB concerns the cell reselection timer Treselection_{RAT} for NB-IoT.

Value in seconds. s0 means 0 second and behaviour as specified in 7.3.2 applies, s3 means 3 seconds and so on.

#### T-Reselection-NB information element

```
-- ASN1START
T-Reselection-NB-r13 ::= ENUMERATED {s0, s3, s6, s9, s12, s15, s18, s21}
-- ASN1STOP
```

## 6.7.3.5 NB-IoT Measurement information elements

## – CQI-NPDCCH-NB

The IE *CQI-NPDCCH-NB* represents the downlink channel quality measurement of the NB-IoT carrier where the random access response is received. The codepoints for the CQI-NPDCCH measurements are according to the mapping table in TS 36.133 [16]. The value *noMeasurements* indicates no measurement reporting.

### CQI-NPDCCH-NB information element

ASN1START					
CQI-NPDCCH-NB-r14 ::=	candidateRep-D,	candidateRep-E,	<pre>candidateRep-B, candidateRep-F, candidateRep-J,</pre>	candidateRep-G,	
ASN1STOP					

## CQI-NPDCCH-Short-NB

The IE *CQI-NPDCCH-Short-NB* represents the short version of the downlink channel quality measurement of the NB-IoT carrier where the random access response is received. The codepoints for the CQI-NPDCCH-Short measurements are according to the mapping table in TS 36.133 [16]. The value *noMeasurements* indicates no measurement reporting.

#### CQI-NPDCCH-Short-NB information element

```
-- ASN1START
CQI-NPDCCH-Short-NB-r14 ::= ENUMERATED {
noMeasurements, candidateRep-1, candidateRep-2, candidateRep-3}
-- ASN1STOP
```

– MeasResultServCell-NB

The IE MeasResultServCell-NB covers the measured results for the serving cell.

### MeasResultServCell-NB information element

```
-- ASN1START

MeasResultServCell-NB-r14 ::= SEQUENCE {

    nrsrpResult-r14 NRSRP-Range-NB-r14,

    nrsrqResult-r14 NRSRQ-Range-NB-r14

}
```

-- ASN1STOP

## – NRSRP-Range-NB

The IE *NRSRP-Range-NB* specifies the value range used in NRSRP measurements and thresholds. Integer value for NRSRP measurements according to mapping table in TS 36.133 [16], Table 9.1.22.9-1.

### NRSRP-Range-NB information element

```
-- ASN1START
NRSRP-Range-NB-r14 ::= INTEGER(0..113)
```

```
-- ASN1STOP
```

## NRSRQ-Range-NB

The IE *NRSRQ-Range-NB* specifies the value range used in NRSRQ measurements and thresholds. Integer value for RSRQ measurements is according to mapping table in TS 36.133 [16], Table 9.1.22.14-1. The UE shall not report values 0 and 34.

#### NRSRQ-Range-NB information element

-- ASN1START

```
NRSRQ-Range-NB-r14 ::= INTEGER(-30..46)
```

-- ASN1STOP

NSSS-RRM-Config-NB

The IE *NSSS-RRM-Config-NB* provides the configuration for NSSS-based RRM measurements. See TS 36.133 [16], TS 36.211 [21] and TS 36.214 [48]. The UE only performs NSSS-based RRM measurement on cells for which the configuration has been provided.

### NSSS-RRM-Config-NB information element

```
-- ASN1START
```

```
NSSS-RRM-Config-NB-r15 ::=
    nsss-RRM-PowerOffset-r15
    nsss-NumOccDiffPrecoders-r15
}
```

```
SEQUENCE {
ENUMERATED {dB-3, db0, dB3},
ENUMERATED {n1, n2, n4, n8} OPTIONAL -- Need OP
```

```
-- ASN1STOP
```

#### NSSS-RRM-Config-NB field descriptions

#### nsss-RRM-PowerOffset

NSSS to NRS ratio for the serving cell as specified in TS 36.214 [48]. Value in dB. Value dB-3 corresponds to -3 dB, dB0 corresponds to 0 dB and so on.

#### nsss-NumOccDiffPrecoders

Number of consecutive NSSS occasions that use different precoders for NSSS transmission. See TS 36.211 [21]. Value *n1* corresponds to 1 occasion, *n2* corresponds to 2 occasions and so on.

For value *n*2, *n*4, and *n*8, UE may assume for *nsss-NumOccDiffPrecoders* consecutive NSSS occasions, E-UTRAN uses different precoders for NSSS transmission. For value *n*1, UE may assume that E-UTRAN always uses the same precoder.

If the field is absent, the UE makes no assumption on the antenna port(s) used for NSSS.

## 6.7.3.6 NB-IoT Other information elements

## – EstablishmentCause-NB

The IE *EstablishmentCause-NB* provides the establishment cause for the RRC connection request or the RRC connection resume request as provided by the upper layers.

### EstablishmentCause-NB information element

ASN1START	
EstablishmentCause-NB-r13 ::=	ENUMERATED { mt-Access, mo-Signalling, mo-Data, mo-ExceptionData, delayTolerantAccess-v1330, spare3, spare2, spare1}

-- ASN1STOP

-- ASN1START

## – UE-Capability-NB

The IE *UE-Capability-NB* is used to convey the NB-IoT UE Radio Access Capability Parameters, see TS 36.306 [5]. The IE *UE-Capability-NB* is transferred in NB-IoT only.

### UE-Capability-NB information element

UE-Capability-NB-r13 ::=	SEQUENCE {	
accessStratumRelease-r13	AccessStratumRelease-NB-r13,	
ue-Category-NB-r13	ENUMERATED {nb1}	OPTIONAL,
multipleDRB-r13	ENUMERATED {supported}	OPTIONAL,

pdcp-Parameters-r13 phyLayerParameters-r13 rf-Parameters-r13	PDCP-Parameters-NB-r13 PhyLayerParameters-NB-r13, RF-Parameters-NB-r13,	OPTIONAL,
dummy }	SEQUENCE {}	OPTIONAL
UE-Capability-NB-Ext-r14-IEs ::= ue-Category-NB-r14 mac-Parameters-r14 phyLayerParameters-v1430 rf-Parameters-v1430	SEQUENCE { ENUMERATED {nb2} MAC-Parameters-NB-r14 PhyLayerParameters-NB-v1430 RF-Parameters-NB-v1430,	OPTIONAL, OPTIONAL, OPTIONAL,
<pre>nonCriticalExtension }</pre>	UE-Capability-NB-v1440-IEs	OPTIONAL
<pre>UE-Capability-NB-v1440-IEs ::=     phyLayerParameters-v1440     nonCriticalExtension }</pre>	SEQUENCE { PhyLayerParameters-NB-v1440 UE-Capability-NB-v14x0-IEs	OPTIONAL, OPTIONAL
UE-Capability-NB-v14x0-IEs ::=	SEQUENCE {	
Following field is only to be us		
<pre>lateNonCriticalExtension     nonCriticalExtension }</pre>	OCTET STRING UE-Capability-NB-v1530-IEs	OPTIONAL, OPTIONAL
UE-Capability-NB-v1530-IEs ::= earlyData-UP-r15	SEQUENCE { ENUMERATED {supported}	OPTIONAL,
rlc-Parameters-r15 mac-Parameters-v1530 phyLayerParameters-v1530	RLC-Parameters-NB-r15, MAC-Parameters-NB-v1530, PhyLayerParameters-NB-v1530	OPTIONAL,
<pre>tdd-UE-Capability-r15 nonCriticalExtension }</pre>	TDD-UE-Capability-NB-r15 SEQUENCE {}	OPTIONAL, OPTIONAL
,		
TDD-UE-Capability-NB-r15 ::= ue-Category-NB-r15 phyLayerParametersRel13-r15	SEQUENCE { ENUMERATED {nb2} PhyLayerParameters-NB-r13	OPTIONAL, OPTIONAL,
phyLayerParametersRel14-r15 phyLayerParameters-v1530	PhyLayerParameters-NB-v1430 PhyLayerParameters-NB-v1530	OPTIONAL, OPTIONAL,
}		
· AccessStratumRelease-NB-r13 ::= sparel,}	ENUMERATED {rel13, rel14, rel15, ;	spare5, spare4, spare3, spare2,
PDCP-Parameters-NB-r13 ::= SE	QUENCE {	
<pre>supportedROHC-Profiles-r13 profile0x0002</pre>	SEQUENCE { BOOLEAN,	
profile0x0003 profile0x0004	BOOLEAN , BOOLEAN ,	
profile0x0006	BOOLEAN,	
profile0x0102	BOOLEAN,	
profile0x0103 profile0x0104	BOOLEAN , BOOLEAN	
<pre>}, maxNumberROHC-ContextSessions-:</pre>	c13 ENUMERATED {cs2, cs4, cs8, cs	12} DEFAULT cs2,
}		
RLC-Parameters-NB-r15 ::=	SEQUENCE {	
<pre>rlc-UM-r15 }</pre>	ENUMERATED {supported}	OPTIONAL
MAC-Parameters-NB-r14 ::= dataInactMon-r14 rai-Support-r14	SEQUENCE { ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL
}	ENGLEIGATED (Supported)	OI I IONAL
MAC-Parameters-NB-v1530 ::=	SEQUENCE {	
sr-SPS-BSR-r15 }	ENUMERATED {supported}	OPTIONAL
PhyLayerParameters-NB-r13 ::= multiTone-r13 multiCarrier-r13 }	SEQUENCE { ENUMERATED {supported} ENUMERATED {supported}	OPTIONAL, OPTIONAL
PhyLayerParameters-NB-v1430 ::=	SEQUENCE {	

<pre>multiCarrier-NPRACH-r14 twoHARQ-Processes-r14 }</pre>	ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL
<pre>PhyLayerParameters-NB-v1440 ::=     interferenceRandomisation-r14 }</pre>	SEQUENCE { ENUMERATED {supported} OPTIONAL
<pre>PhyLayerParameters-NB-v1530 ::=     mixedOperationMode-r15     sr-WithHARQ-ACK-r15     sr-WithoutHARQ-ACK-r15     nprach-Format2-r15     additionalTransmissionSIB1-r15     npusch-3dot75kHz-SCS-TDD-r15 }</pre>	SEQUENCE { ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL, ENUMERATED {supported} OPTIONAL
<pre>RF-Parameters-NB-r13 ::=     supportedBandList-r13     multiNS-Pmax-r13 }</pre>	SEQUENCE { SupportedBandList-NB-r13, ENUMERATED {supported} OPTIONAL
RF-Parameters-NB-v1430 ::= powerClassNB-14dBm-r14 }	SEQUENCE { ENUMERATED {supported} OPTIONAL
SupportedBandList-NB-r13 ::=	SEQUENCE (SIZE (1maxBands)) OF SupportedBand-NB-r13
<pre>SupportedBand-NB-r13 ::=     band-r13     powerClassNB-20dBm-r13 }</pre>	SEQUENCE { FreqBandIndicator-NB-r13, ENUMERATED {supported} OPTIONAL
ASN1STOP	

UE-Capability-NB field descriptions	FDD/TDD appl	FDD/TDD diff
accessStratumRelease	FDD/TDD	No
Set to rel15 in this version of the specification.		
additionalTransmissionSIB1	FDD	-
Indicates whether the UE supports additional SIB1 transmission as specified in TS 36.213		
[23].		
dataInactMon	FDD/TDD	No
Indicates whether the UE supports the data inactivity monitoring as specified in TS 36.321		
[6].		
dummy	NA	NA
This field is not used in the specification. It shall not be sent by the UE.		
earlyData-UP	FDD	-
Indicates whether the UE supports EDT for User plane CIoT EPS optimisations, as defined		
in TS 24.301 [35].		
interferenceRandomisation	FDD	-
For FDD: Indicates whether the UE supports interference randomisation in connected mode		
as defined in TS.36.211 [21].		NI-
maxNumberROHC-ContextSessions	FDD/TDD	No
Set to the maximum number of concurrently active ROHC contexts supported by the UE, excluding context sessions that leave all headers uncompressed. cs2 corresponds with 2		
(context sessions), cs4 corresponds with 4 and so on. The network ignores this field if the		
UE supports none of the ROHC profiles in <i>supportedROHC-Profiles</i> .		
mixedOperationMode	FDD	
Defines whether the UE supports multi-carrier operation with mixed operation mode,	FDD	-
standalone or inband/guardband, between the anchor carrier and the non-anchor carrier for		
unicast, paging, and random access as specified in TS 36.300 [9].		
multiCarrier	FDD/TDD	Yes
Defines whether the UE supports multi -carrier operation.	TUD/TUD	163
multicarrier-NPRACH	FDD/TDD	Yes
Defines whether the UE supports NPRACH on non-anchor carrier as specified in TS 36.321	100/100	163
[6].		
multipleDRB	FDD/TDD	No
Defines whether the UE supports multiple DRBs.	100,100	
multiNS-Pmax	FDD/TDD	No
Defines whether the UE supports the mechanisms defined for NB-IoT cells broadcasting	100,100	
NS-PmaxList-NB.		
multiTone	FDD/TDD	Yes
Defines whether the UE supports UL multi-tone transmissions on NPUSCH.		
nprach-Format2	FDD	-
Defines whether the UE supports NPRACH resources using preamble format 2.		
npusch-3dot75kHz-SCS-TDD	TDD	-
Indicates whether the UE supports NPUSCH with 3.75kHz SCS for TDD.		
powerClassNB-14dBm	FDD/TDD	No
Defines whether the UE supports power class 14dBm in all the bands supported by the UE		
as specified in TS 36.101 [42].		
If powerClassNB-20dBm is included, the UE shall not include the field powerClassNB-		
14dBm.		
powerClassNB-20dBm	FDD/TDD	No
Defines whether the UE supports power class 20dBm in NB-IoT for the band, as specified		
in TS 36.101 [42]. If neither powerClassNB-14dBm nor powerClassNB-20dBm is included,		
UE supports power class 23 dBm in the NB-IoT band.		
rai-Support	FDD/TDD	No
Defines whether the UE supports release assistance indication (RAI) as specified in TS		
36.321 [6].		
rlc-UM	FDD/TDD	No
Defines whether the UE supports RLC UM as specified in TS 36.322 [7].		
supportedBandList	FDD/TDD	No
Includes the supported NB-IoT bands as defined in TS 36.101 [42].		
sr-SPS-BSR	FDD	-
Defines whether the UE supports SR using SPS BSR as specified in TS 36.321 [6].		
sr-withHARQ-ACK	FDD	-
Defines whether the UE supports physical layer SR with HARQ ACK as specified in TS		
36.213 [23].		
sr-withoutHARQ-ACK	FDD	-
Defines whether the UE supports physical layer SR without HARQ ACK as specified in TS		
36.211 [21] and TS 36.213 [23].		

UE-Capability-NB field descriptions	FDD/TDD appl	FDD/TDD diff
supportedROHC-Profiles	FDD/TDD	No
List of supported ROHC profiles as defined in TS 36.323 [8].		
twoHARQ-Processes	FDD/TDD	Yes
Defines whether the UE supports two HARQ processes operation in DL and UL as		
specified in TS 36.212 [22] and TS 36.213 [23].		
ue-Category-NB	FDD/TDD	Yes
UE category as defined in TS 36.306 [5]. Value nb1 corresponds to UE category NB1,		
value nb2 corresponds to UE category NB2.		
A UE shall always include the field ue-Category-NB-r13 in this version of the specification.		

- NOTE 1: The IE *UE-Capability-NB* does not include AS security capability information, since these are the same as the security capabilities that are signalled by NAS. Consequently AS need not provide "man-in-the-middle" protection for the security capabilities.
- NOTE 2: The column 'FDD/TDD appl' indicates the applicability to the xDD mode: 'FDD' means applicable to FDD only, 'TDD' means applicable to TDD only and 'FDD/TDD' means applicable to FDD and TDD.
- NOTE 3: The column 'FDD/TDD diff' indicates if the UE is allowed to signal a different value for FDD and TDD when the capability applies to both FDD and TDD modes. '-' is used when the capability applies to one mode only, 'No' is used for dual mode capabilities where a common value is signalled for both modes, and 'Yes' is used for dual mode capabilities where a separate value is signalled for each mode. Common capabilities and FDD capabilities are reported in the fields of *UE-Capability-NB* except field *tdd-UE-Capability*. TDD capabilities are reported in *tdd-UE-Capability*.

## UE-RadioPagingInfo-NB

The IE UE-RadioPagingInfo-NB contains UE NB-IoT capability information needed for paging.

#### UE-RadioPagingInfo-NB information element

```
-- ASN1START
UE-RadioPagingInfo-NB-r13 ::=
                                    SEQUENCE {
    ue-Category-NB-r13
                                    ENUMERATED {nb1}
                                                                OPTIONAL,
    [[ multiCarrierPaging-r14
                                   ENUMERATED {true}
                                                                OPTIONAL
    1],
       mixedOperationMode-r15 ENUMERATED {supported}
                                                                OPTIONAL,
    [[
        wakeUpSignal-r15
                                    ENUMERATED {true}
                                                                OPTIONAL,
        wakeUpSignalMinGap-eDRX-r15 ENUMERATED {ms40, ms240, ms1000, ms2000}
                                                                                OPTIONAL,
        multiCarrierPagingTDD-r15 ENUMERATED {true}
                                                                OPTIONAL
    ]]
}
```

```
-- ASN1STOP
```

### UE-RadioPagingInfo-NB field descriptions

#### mixedOperationMode

Indicates whether the UE supports multi-carrier operation with mixed operation mode, standalone or inband/guardband, between the anchor carrier and non-anchor carrier for unicast, paging, and random access, as specified in TS 36.300 [9].

## multiCarrierPaging

#### Indicates whether the UE supports paging on non-anchor carriers as defined in TS 36.304 [4].

## multiCarrierPagingTDD

Indicates whether the UE supports paging on non-anchor carriers for TDD as defined in TS 36.304 [4]. *ue-Category-NB* 

# UE NB-IOT category as defined in TS 36.306 [5]. A UE shall always include the field *ue-Category-NB-r13* in this version of the specification.

#### wakeUpSignal

Indicates whether the UE supports WUS for paging in DRX in FDD as specified in TS 36.304 [4]. If this field is included, the minimum gap between WUS and associated PO for DRX is fixed as 40 ms.

#### wakeUpSignalMinGap-eDRX

Indicates the minimum gap the UE supports between WUS and associated PO in case of eDRX in FDD, as specified in TS 36.304 [4]. Value *ms40* corresponds to 40 ms, value *ms240* corresponds to 240 ms and so on. If this field is included, the UE shall also indicate support for WUS for paging in DRX,

## UE-TimersAndConstants-NB

The IE *UE-TimersAndConstants-NB* contains timers and constants used by the UE in either RRC_CONNECTED or RRC_IDLE.

#### UE-TimersAndConstants-NB information element

-- ASN1START

UE-TimersAndConstants-NB-r13 ::=	SEQUENCE {		
t300-r13	ENUMERATED {		
0000 110	ms2500, ms4000, ms6000, ms10000,		
	ms15000, ms25000, ms40000, ms60000},		
t301-r13	ENUMERATED {		
	ms2500, ms4000, ms6000, ms10000,		
	ms15000, ms25000, ms40000, ms60000},		
t310-r13	ENUMERATED {		
0010 110	ms0, ms200, ms500, ms1000, ms2000, ms4000, ms8000},		
n310-r13	ENUMERATED {		
	n1, n2, n3, n4, n6, n8, n10, n20},		
t311-r13	ENUMERATED {		
0011 110	ms1000, ms3000, ms5000, ms10000, ms15000,		
	ms20000, ms30000},		
n311-r13	ENUMERATED {		
	n1, n2, n3, n4, n5, n6, n8, n10},		
,			
[[ t311-v1350	ENUMERATED {		
••••••	ms40000, ms60000, ms90000, ms120000}		
	OPTIONAL Need OR		
]],			
[[ t300-v1530	ENUMERATED {		
	ms80000, ms100000, ms120000} OPTIONAL, Cond TDD		
t301-v1530	ENUMERATED {		
	ms80000, ms100000, ms120000} OPTIONAL, Cond TDD		
t311-v1530	ENUMERATED {		
	ms160000, ms200000} OPTIONAL, Cond TDD		
t300-r15	ENUMERATED {ms6000, ms10000, ms15000, ms25000, ms40000,		
	ms60000, ms80000, ms120000} OPTIONAL Cond EDT		
]]			
}			

-- ASN1STOP

UE-TimersAndConstants-NB field descriptions		
n3xy		
Constants are described in clause 7.4. n1 corresponds with 1, n2 corresponds with 2 and so on.		
t3xy		
Timers are described in clause 7.3. Value ms0 corresponds with 0 ms, ms200 corresponds with 200 ms and so on		

The UE shall use the extended values t311-v1350, t300-v1530, t301-v1530 and t311-v1530, if present, and ignore the value signaled by t311-r13, t300-r13, t301-r13 and t311-r13 respectively.

t300-r15 is only applicable for EDT. UE performing EDT shall use t300-r15, if present.

Conditional presence	Explanation	
EDT	The field is optionally present, Need OR, if <i>edt-Parameters</i> is present in SIB2-NB;	
	otherwise the field is not present and the UE shall delete any existing value for this field.	
TDD	The field is optionally present, Need OR, in TDD mode. Otherwise, the field is not	
	present.	

#### **NB-IoT MBMS information elements** 6.7.3.7

Void

-- ASN1START

#### 6.7.3.7a NB-IoT SC-PTM information elements

## SC-MTCH-InfoList-NB

The IE SC-MTCH-InfoList-NB provides the list of ongoing MBMS sessions transmitted via SC-MRB and for each MBMS session, the associated G-RNTI and scheduling information.

### SC-MTCH-InfoList-NB information element

```
SC-MTCH-InfoList-NB-r14 ::=
                                     SEQUENCE (SIZE (0.. maxSC-MTCH-NB-r14)) OF SC-MTCH-Info-NB-r14
SC-MTCH-Info-NB-r14 ::=
                                     SEQUENCE
                                     CHOICE {
    sc-mtch-CarrierConfig-r14
dl-CarrierConfig-r14
dl-CarrierIndex-r14
                                                  DL-CarrierConfigCommon-NB-r14,
                                             INTEGER (0.. maxNonAnchorCarriers-NB-r14)
    },
    mbmsSessionInfo-r14
                                         MBMSSessionInfo-r13,
   g-RNTI-r14
                                       BIT STRING(SIZE(16))
                                                                         OPTIONAL,
   sc-mtch-SchedulingInfo-r14SC-MTCH-SchedulingInfo-NB-r14OPTIONAL,sc-mtch-NeighbourCell-r14BIT STRING (SIZE(maxNeighCell-SCPTM-NB-r14))
                                                                                            -- Need OP
                                                                                           OPTIONAL, --
Need OP
    npdcch-NPDSCH-MaxTBS-SC-MTCH-r14
                                             ENUMERATED {n680, n2536},
    npdcch-NumRepetitions-SC-MTCH-r14 ENUMERATED {r1, r2, r4, r8, r16,
                                                      r32, r64, r128, r256,
                                                      r512, r1024, r2048, spare4,
                                                      spare3, spare2, spare1},
   npdcch-StartSF-SC-MTCH-r14 ENUMERATED {vldot5, v2, v4, v8,
                                                      v16, v32, v48, v64},
   npdcch-Offset-SC-MTCH-r14
                                         ENUMERATED {zero, oneEighth, oneQuarter,
                                                      threeEighth, oneHalf, fiveEighth,
                                                      threeQuarter, sevenEighth},
    . . .
}
SC-MTCH-SchedulingInfo-NB-r14 ::=
                                         SEQUENCE
                                                      {
   onDurationTimerSCPTM-r14
                                             ENUMERATED {
                                                 pp1, pp2, pp3, pp4,
                                                  pp8, pp16, pp32, spare},
    drx-InactivityTimerSCPTM-r14
                                             ENUMERATED
                                                 pp0, pp1, pp2, pp3,
                                                  pp4, pp8, pp16, pp32},
    schedulingPeriodStartOffsetSCPTM-r14
                                             CHOICE {
        sf10
                                                  INTEGER(0..9),
        sf20
                                                  INTEGER(0..19),
        sf32
                                                  INTEGER(0..31),
                                                  INTEGER(0..39),
        sf40
        sf64
                                                  INTEGER(0..63),
        sf80
                                                  INTEGER(0..79),
```

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sf128	<pre>INTEGER(0127),</pre>	
sf160	<pre>INTEGER(0159),</pre>	
sf256	<pre>INTEGER(0255),</pre>	
sf320	<pre>INTEGER(0319),</pre>	
sf512	<pre>INTEGER(0511),</pre>	
sf640	<pre>INTEGER(0639),</pre>	
sf1024	INTEGER(01023),	
sf2048	INTEGER(02047),	
sf4096	INTEGER(04095),	
sf8192	INTEGER(08191)	
},		
}		

-- ASN1STOP

SC-MTCH-InfoList-NB field descriptions	
dl-CarrierConfig	
Downlink carrier used for SC-MTCH. E-UTRAN cannot configure a downlink carrier operating	in mixed operation
mode.	
dl-CarrierIndex	
Index to a downlink carrier signalled in system information. Value '0' corresponds to the anche	or carrier, value '1'
corresponds to the first entry in dl-ConfigList in SystemInformationBlockType22-NB, value '2'	corresponds to the
second entry in <i>dl-ConfigList</i> and so on.	
drx-InactivityTimerSCPTM	
Timer for SC-MTCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value r	op1 corresponds to 1
NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on.	
g-RNTI	
G-RNTI used to scramble the scheduling and transmission of a SC-MTCH.	
mbmsSessionInfo	
Indicates the ongoing MBMS session in a SC-MTCH.	
npdcch-NPDSCH-MaxTBS-SC-MTCH	
Maximum NPDSCH TBS for the SC-MTCH, see TS 36.213 [23]. Value n680 corresponds to 6	580 bits and value <i>n2536</i>
corresponds to 2536 bits.	
npdcch-NumRepetition-SC-MTCH	
The maximum number of NPDCCH repetitions the UE needs to monitor for SC-MTCH multica	ast search space, see TS
36.213 [23].	• •
npdcch-Offset-SC-MTCH	
Fractional period offset of starting subframe for NPDCCH multicast search space for SC-MTC	CH, see TS 36.213 [23].
npdcch-startSF-SC-MTCH	
Starting subframes configuration of the NPDCCH multicast search space for SC-MTCH, see	TS 36.213 [23].
onDurationTimerSCPTM	
Timer for SC-MTCH reception in TS 36.321 [6]. Value in number of NPDCCH periods. Value r	op1 corresponds to 1
NPDCCH period, pp2 corresponds to 2 NPDCCH periods and so on.	
schedulingPeriodStartOffsetSCPTM	
SCPTM-SchedulingCycle and SCPTM-SchedulingOffset in TS 36.321 [6]. The value of SCPT	
number of sub-frames. Value sf10 corresponds to 10 sub-frames, sf20 corresponds to 20 sub	-frames and so on. The
value of SCPTM-SchedulingOffset is in number of sub-frames.	
sc-mtch-CarrierConfig	
Downlink carrier that is used for SC-MTCH.	
sc-mtch-NeighbourCell	·
Indicates neighbour cells which also provide this service on SC-MTCH. The first bit is set to 1	if the service is provide
on SC-MTCH in the first cell in scptmNeighbourCellList, otherwise it is set to 0. The second b	
is provided on SC-MTCH in the second cell in scptmNeighbourCellList, and so on. If this field	
assume that this service is not available on SC-MTCH in any neighbour cell.	
sc-mtch-SchedulingInfo	
DRX information for the SC-MTCH.	
If this field is absent, DRX is not used for the SC-MTCH.	

## SCPTM-NeighbourCellList-NB

The IE *SCPTM-NeighbourCellList-NB* indicates a list of neighbour cells where ongoing MBMS sessions provided via SC-MRB in the current cells are also provided.

—

SCPTM-NeighbourCellList-NB-r14 ::= SEQUENCE (SIZE (1..maxNeighCell-SCPTM-NB-r14)) OF PCI-ARFCN-NBr14 PCI-ARFCN-NB-r14 ::= SEQUENCE { physCellId-r14 PhysCellId, carrierFreq-r14 CarrierFreq-NB-r13 OPTIONAL -- Need OP } -- ASN1STOP

#### SCPTM-NeighbourCellList-NB field descriptions

*physCellId* Physical Cell Identity of the neighbour cell. *carrierFreq* Carrier frequency of the neighbour cell.

Absence of the IE means that the neighbour cell is on the same frequency as the current cell.

## 6.7.4 NB-IoT RRC multiplicity and type constraint values

Multiplicity and type constraint definitions

```
    ASN1START
    maxNPRACH-Resources-NB-r13 INTEGER ::= 3 -- Maximum number of NPRACH resources for NB-IoT
    maxNonAnchorCarriers-NB-r14 INTEGER ::= 15 -- Maximum number of non-anchor carriers for NB-IoT
    maxDRB-NB-r13 INTEGER ::= 2 -- Maximum number of Data Radio Bearers for NB-IoT
    maxNeighCell-SCPTM-NB-r14 INTEGER ::= 8 -- Maximum number of SCPTM neighbour cells
    maxNS-Pmax-NB-r13 INTEGER ::= 4 -- Maximum number of NS and P-Max values per band
    maxSC-MTCH-NB-r14 INTEGER ::= 64 -- Maximum number of SC-MTCHs in one cell for NB-IoT
    maxSI-Message-NB-r13 INTEGER ::= 8 -- Maximum number of SI messages for NB-IoT
```

-- ASN1STOP

## End of NBIOT-RRC-Definitions

-- ASN1START

END

-- ASN1STOP

## 6.7.5 Direct Indication Information

Direct Indication information is transmitted on NPDCCH using P-RNTI but without associated *Paging-NB* message. Table 6.7.5-1 defines the Direct Indication information, see TS 36.212 [22], clause 6.4.3.3.

When bit n is set to 1, the UE shall behave as if the corresponding field is set in the *Paging-NB* message, see 5.3.2.3. Bit 1 is the least significant bit.

Bit	Field in Direct Indication information	
1	systemInfoModification	
2	systemInfoModification-eDRX	
3, 4, 5,	Not used, and shall be ignored by UE if received	
6, 7, 8		

### Table 6.7.5-1: Direct Indication information

## 7 Variables and constants

## 7.1 UE variables

NOTE: To facilitate the specification of the UE behavioural requirements, UE variables are represented using ASN.1. Unless explicitly specified otherwise, it is however up to UE implementation how to store the variables. The optionality of the IEs in ASN.1 is used only to indicate that the values may not always be available.

_

## EUTRA-UE-Variables

This ASN.1 segment is the start of the E-UTRA UE variable definitions.

-- ASN1START EUTRA-UE-Variables DEFINITIONS AUTOMATIC TAGS ::= BEGIN IMPORTS AbsoluteTimeInfo-r10, AreaConfiguration-r10 AreaConfiguration-v1130, ARFCN-ValueNR-r15, BT-NameList-r15, CarrierFreqGERAN, CellIdentity, CellList-r15, ConnEstFailReport-r11, EUTRA-CarrierList-r15, SpeedStateScaleFactors, C-RNTI. LoggingDuration-r10, LoggingInterval-r10, LogMeasInfo-r10, MeasCSI-RS-Id-r12, MeasId. MeasId-v1250, MeasIdToAddModList, MeasIdToAddModListExt-r12, MeasIdToAddModList-v1310, MeasIdToAddModListExt-v1310, MeasObjectToAddModList, MeasObjectToAddModList-v9e0, MeasObjectToAddModListExt-r13, MeasResultListIdle-r15, MeasScaleFactor-r12, MobilityStateParameters, NeighCellConfig, PhysCellId, PhysCellIdCDMA2000, PhysCellIdGERAN, PhysCellIdUTRA-FDD, PhysCellIdUTRA-TDD, PLMN-Identity, PLMN-IdentityList3-r11, QuantityConfig, ReportConfigToAddModList, RLF-Report-r9, TargetMBSFN-AreaList-r12, TraceReference-r10, Tx-ResourcePoolMeasList-r14, VisitedCellInfoList-r12, maxCellMeas, maxCSI-RS-Meas-r12, maxMeasId, maxMeasId-r12. maxRS-Index-r15 PhysCellIdNR-r15, RS-IndexNR-r15, UL-DelayConfig-r13, WLAN-CarrierInfo-r13,

```
WLAN-Identifiers-r12,
WLAN-Id-List-r13,
WLAN-NameList-r15,
WLAN-Status-r13,
WLAN-Status-v1430,
WLAN-SuspendConfig-r14
```

FROM EUTRA-RRC-Definitions;

-- ASN1STOP

VarConnEstFailReport

The UE variable VarConnEstFailReport includes the connection establishment failure information.

#### VarConnEstFailReport UE variable

ConnEstFailReport-r11,

PLMN-Identity

```
-- ASN1START
                                    SEQUENCE {
VarConnEstFailReport-r11 ::=
   connEstFailReport-r11
    plmn-Identity-r11
}
```

-- ASN1STOP

## VarLogMeasConfig

The UE variable VarLogMeasConfig includes the configuration of the logging of measurements to be performed by the UE while in RRC_IDLE, covering intra-frequency, inter-frequency, inter-RAT mobility and MBSFN related measurements. If MBSFN logging is configured, the UE performs logging of measurements while in both RRC_IDLE and RRC_CONNECTED. Otherwise, the UE performs logging of measurements only while in RRC_IDLE.

### VarLogMeasConfig UE variable

ASN1START		
<pre>VarLogMeasConfig-r10 ::=     areaConfiguration-r10     loggingDuration-r10     loggingInterval-r10 }</pre>	SEQUENCE { AreaConfiguration-r10 LoggingDuration-r10, LoggingInterval-r10	OPTIONAL,
<pre>VarLogMeasConfig-r11 ::=     areaConfiguration-r10     areaConfiguration-v1130     loggingDuration-r10     loggingInterval-r10 }</pre>		OPTIONAL, OPTIONAL,
<pre>VarLogMeasConfig-r12 ::=     areaConfiguration-r10     areaConfiguration-v1130     loggingDuration-r10     loggingInterval-r10     targetMBSFN-AreaList-r12 }</pre>	AreaConfiguration-v1130 LoggingDuration-r10, LoggingInterval-r10,	OPTIONAL, OPTIONAL, OPTIONAL
<pre>VarLogMeasConfig-r15 ::=     areaConfiguration-r10     areaConfiguration-v1130     loggingDuration-r10     loggingInterval-r10     targetMBSFN-AreaList-r12     bt-NameList-r15     wlan-NameList-r15 }</pre>	AreaConfiguration-v1130 LoggingDuration-r10, LoggingInterval-r10, TargetMBSFN-AreaList-r12	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL
2 011 070 0		

-- ASN1STOP

## VarLogMeasReport

The UE variable VarLogMeasReport includes the logged measurements information.

#### VarLogMeasReport UE variable

```
-- ASN1START
VarLogMeasReport-r10 ::=
                                          SEQUENCE {
    traceReference-r10
                                          TraceReference-r10,
    traceRecordingSessionRef-r10
tce-Id-r10
                                              OCTET STRING (SIZE (2)),
    tce-Id-r10
                                         OCTET STRING (SIZE (1)),
    plmn-Identity-r10
                                          PLMN-Identity,
    absoluteTimeInfo-r10
                                           AbsoluteTimeInfo-r10,
    logMeasInfoList-r10
                                          LogMeasInfoList2-r10
}
VarLogMeasReport-r11 ::= SEQUENCE {
    traceReference-r10 TraceReference-r10,
traceRecordingSessionRef-r10 OCTET STRING (SIZE (2)),
tce-Id-r10 OCTET STRING (SIZE (2)),
    plmn-IdentityList-r11
                                          PLMN-IdentityList3-r11,
    absoluteTimeInfo-r10
                                          AbsoluteTimeInfo-r10,
    logMeasInfoList-r10
                                           LogMeasInfoList2-r10
}
LogMeasInfoList2-r10 ::=
                                           SEQUENCE (SIZE (1..maxLogMeas-r10)) OF LogMeasInfo-r10
-- ASN1STOP
```

VarMeasConfig

The UE variable *VarMeasConfig* includes the accumulated configuration of the measurements to be performed by the UE, covering intra-frequency, inter-frequency and inter-RAT mobility related measurements.

NOTE: The amount of measurement configuration information, which a UE is required to store, is specified in clause 11.1. If the number of frequencies configured for a particular RAT exceeds the minimum performance requirements specified in TS 36.133 [16], it is up to UE implementation which frequencies of that RAT are measured. If the total number of frequencies for all RATs provided to the UE in the measurement configuration exceeds the minimum performance requirements specified in TS 36.133 [16], it is up to UE implementation which frequencies for all RATs provided to the UE in the measurement configuration exceeds the minimum performance requirements specified in TS 36.133 [16], it is up to UE implementation which frequencies/RATs are measured.

#### VarMeasConfig UE variable

ASN1START		
VarMeasConfig ::=	SEQUENCE {	
Measurement identities		
measIdList	MeasIdToAddModList	OPTIONAL,
measIdListExt-r12	MeasIdToAddModListExt-r12	OPTIONAL,
measIdList-v1310	MeasIdToAddModList-v1310	OPTIONAL,
measIdListExt-v1310	MeasIdToAddModListExt-v1310	OPTIONAL,
Measurement objects		
measObjectList	MeasObjectToAddModList	OPTIONAL,
measObjectListExt-r13	MeasObjectToAddModListExt-r13	OPTIONAL,
measObjectList-v9i0	MeasObjectToAddModList-v9e0	OPTIONAL,
Reporting configurations		
reportConfigList	ReportConfigToAddModList	OPTIONAL,
Other parameters		
quantityConfig	QuantityConfig	OPTIONAL,
measScaleFactor-r12	MeasScaleFactor-r12	OPTIONAL,
s-Measure	INTEGER (-14044)	OPTIONAL,
speedStatePars	CHOICE {	
release	NULL,	
setup	SEQUENCE {	
mobilityStateParameters	MobilityStateParameters	,
timeToTrigger-SF	SpeedStateScaleFactors	
}		
}		OPTIONAL,
allowInterruptions-r11	BOOLEAN	OPTIONAL
}		

-- ASN1STOP

## VarMeasIdleConfig

The UE variable *VarMeasIdleConfig* includes the configuration of the measurements to be performed by the UE while in RRC_IDLE for E-UTRA inter-frequency measurements. The UE performs logging of these measurements only while in RRC_IDLE.

### VarMeasIdleConfig UE variable

- VarMeasIdleReport

The UE variable VarMeasIdleReport includes the logged measurements information.

#### VarMeasIdleReport UE variable

```
-- ASN1START
VarMeasIdleReport-r15 ::= SEQUENCE {
    measReportIdle-r15 MeasResultListIdle-r15
}
-- ASN1STOP
```

## VarMeasReportList

The UE variable VarMeasReportList includes information about the measurements for which the triggering conditions have been met.

#### VarMeasReportList UE variable

```
-- ASN1START
VarMeasReportList ::=
                                    SEQUENCE (SIZE (1..maxMeasId)) OF VarMeasReport
                                    SEQUENCE (SIZE (1..maxMeasId-r12)) OF VarMeasReport
VarMeasReportList-r12 ::=
                                    SEQUENCE {
VarMeasReport ::=
    -- List of measurement that have been triggered
   measId
                                       MeasId,
    measId-v1250
                                        MeasId-v1250
                                                                        OPTIONAL,
                                       CSI-RS-TriggeredList-r12 OPTIONAL,
   cellsTriggeredList
                                       CellsTriggeredList
   csi-RS-TriggeredList-r12
poolsTriggeredList-r14
    poolsTriggeredList-r14
                                       Tx-ResourcePoolMeasList-r14 OPTIONAL,
   numberOfReportsSent
                                        INTEGER
}
CellsTriggeredList ::=
                                   SEQUENCE (SIZE (1..maxCellMeas)) OF CHOICE {
    physCellIdEUTRA
                                            PhysCellId,
   physCellIdUTRA
                                            CHOICE {
       fdd
                                                PhysCellIdUTRA-FDD,
       tdd
                                                PhysCellIdUTRA-TDD
    },
    physCellIdGERAN
                                            SEQUENCE {
       carrierFreq
                                                CarrierFreqGERAN,
       physCellId
                                                PhysCellIdGERAN
    },
    physCellIdCDMA2000
                                            PhysCellIdCDMA2000,
    wlan-Identifiers-r13
                                            WLAN-Identifiers-r12,
```

<pre>physCellIdNR-r15 carrierFreq physCellId rs-IndexList-r15 } }</pre>	SEQUENCE { ARFCN-ValueNR-r15, PhysCellIdNR-r15, SSB-IndexList-r15 OPTIONAL	
CSI-RS-TriggeredList-r12 ::	= SEQUENCE (SIZE (1maxCSI-RS-Meas-r12)) OF MeasCSI-RS-Id-r12	
SSB-IndexList-r15::=	SEQUENCE (SIZE (1maxRS-Index-r15)) OF RS-IndexNR-r15	
ASN1STOP		

## VarMobilityHistoryReport

The UE variable VarMobilityHistoryReport includes the mobility history information.

```
-- ASN1START
VarMobilityHistoryReport-r12 ::= VisitedCellInfoList-r12
```

-- ASN1STOP

## – VarPendingRnaUpdate

The UE variable *VarPendingRnaUpdate* indicates whether there is a pending RNAU procedure or not. The setting of this BOOLEAN variable to TRUE means that there is a pending RANU procedure.

### VarPendingRnaUpdate UE variable

```
-- ASN1START
VarPendingRnaUpdate-r15 ::= SEQUENCE {
pendingRnaUpdate BOOLEAN OPTIONAL
}
-- ASN1STOP
```

## VarRLF-Report

The UE variable VarRLF-Report includes the radio link failure information or handover failure information.

### VarRLF-Report UE variable

```
-- ASN1START
VarRLF-Report-r10 ::=
                                    SEQUENCE {
                                            RLF-Report-r9,
   rlf-Report-r10
    plmn-Identity-r10
                                            PLMN-Identity
}
VarRLF-Report-r11 ::=
                                    SEQUENCE {
   rlf-Report-r10
                                        RLF-Report-r9,
    plmn-IdentityList-r11
                                        PLMN-IdentityList3-r11
}
-- ASN1STOP
```

## VarShortINACTIVE-MAC-Input

The UE variable *VarShortINACTIVE-MAC-Input* specifies the input used to generate the *shortResume-MAC-I* during RRC Connection Resume procedure for RRC_INACTIVE.

#### VarShortINACTIVE-MAC-Input UE variable

-- ASN1START

PhysCellId,

C-RNTI

```
VarShortINACTIVE-MAC-Input-r15 ::=
                                         SEQUENCE {
    cellIdentity-r15
    physCellId-r15
    c-RNTI-r15
}
-- ASN1STOP
```

VarShortINACTIVE-MAC-Input field descriptions

CellIdentity,

cellIdentity An input variable used to calculate the shortResume-MAC-I. Set to CellIdentity included in cellIdentity (without suffix) in SIB1 of the current cell. c-RNTI Set to C-RNTI that the UE had in the PCell it was connected to prior to suspension of the RRC connection. physCellId

Set to the physical cell identity of the PCell the UE was connected to prior to suspension of the RRC connection.

## VarShortMAC-Input

The UE variable VarShortMAC-Input specifies the input used to generate the shortMAC-I.

#### VarShortMAC-Input UE variable

```
VarShortMAC-Input ::=
    cellIdentity
    physCellId
    c-RNTI
}
-- ASN1STOP
```

-- ASN1START

SEQUENCE { CellIdentity, PhysCellId, C-RNTI

```
VarShortMAC-Input field descriptions
```

cellIdentity An input variable used to calculate the shortMAC-I. Set to CellIdentity included in cellIdentity (without suffix) in SIB1 of the current cell. c-RNTI

Set to C-RNTI that the UE had in the PCell it was connected to prior to the failure.

physCellId

-- ASN1STOP

Set to the physical cell identity of the PCell the UE was connected to prior to the failure.

## VarShortResumeMAC-Input

The UE variable VarShortResumeMAC-Input specifies the input used to generate the shortResumeMAC-I during RRC Connection Resume procedure.

#### VarShortResumeMAC-Input UE variable

```
-- ASN1START
VarShortResumeMAC-Input-r13 ::=
                                    SEQUENCE {
                                             CellIdentity,
    cellIdentity-r13
    physCellId-r13
                                            PhysCellId,
    c-RNTI-r13
                                             C-RNTI,
    resumeDiscriminator-r13
                                            BIT STRING(SIZE(1))
}
```

VarShortResumeMAC-Input field descriptions
cellIdentity
An input variable used to calculate the shortResumeMAC-I. Set to CellIdentity included in cellIdentity (without suffix) in
SIB1 of the current cell.
c-RNTI
Set to C-RNTI that the UE had in the PCell it was connected to prior to suspension of the RRC connection.
physCellId
Set to the physical cell identity of the PCell the UE was connected to prior to suspension of the RRC connection.
resumeDiscriminator
A constant that allows differentiation in the calculation of the MAC-I for shortResumeMAC-I
The resumeDiscriminator is set to '1'

## VarWLAN-MobilityConfig

The UE variable VarWLAN-MobilityConfig includes information about WLAN for access selection and mobility.

#### VarWLAN-MobilityConfig UE variable

ENUMERATED {true} OPTIONAL, WLAN-SuspendConfig-r14 OPTIONAL

SEQUENCE {

```
-- ASN1START
```

```
VarWLAN-MobilityConfig ::=
   wlan-MobilitySet-r13
   successReportRequested
   wlan-SuspendConfig-r14
}
```

-- ASN1STOP

	VarWLAN-MobilityConfig field descriptions		
Γ	wlan-MobilitySet		
	Indicates the WLAN mobility set configured.		
Γ	successReportRequested		
	Indicates whether the LIE shall report augessetul connection to W/LANL Applicable to LW/A and LW/IP		

Indicates whether the UE shall report successful connection to WLAN. Applicable to LWA and LWIP.

## VarWLAN-Status

The UE variable *VarWLAN-Status* includes information about the status of WLAN connection for LWA, RCLWI or LWIP.

#### VarWLAN-Status UE variable

```
-- ASN1START

VarWLAN-Status-r13 ::= SEQUENCE {

status-r13 WLAN-Status-r13,

status-r14 WLAN-Status-v1430 OPTIONAL

}

-- ASN1STOP
```

#### VarWLAN-Status field descriptions

status Indicates the connection status to WLAN and causes for connection failures.

## Multiplicity and type constraint definitions

This clause includes multiplicity and type constraints applicable (only) for UE variables.

-- ASN1START

maxLogMeas-r10

INTEGER ::= 4060-- Maximum number of logged measurement entries -- that can be stored by the UE

-- ASN1STOP

```
- End of EUTRA-UE-Variables
```

```
-- ASN1START
```

END

_

```
-- ASN1STOP
```

## 7.1a NB-IoT UE variables

NOTE: To facilitate the specification of the UE behavioural requirements, UE variables are represented using ASN.1. Unless explicitly specified otherwise, it is however up to UE implementation how to store the variables. The optionality of the IEs in ASN.1 is used only to indicate that the values may not always be available.

## NBIOT-UE-Variables

This ASN.1 segment is the start of the NB-IoT UE variable definitions.

```
-- ASN1START

NBIOT-UE-Variables DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

VarShortMAC-Input,

VarShortResumeMAC-Input-r13

FROM EUTRA-UE-Variables;

VarShortMAC-Input-NB-r13 ::= VarShortMAC-Input

VarShortResumeMAC-Input-NB-r13 ::= VarShortResumeMAC-Input-r13

-- ASN1STOP
```

– End of NE

## End of NBIOT-UE-Variables

-- ASN1START END -- ASN1STOP

## 7.2 Counters

Counter	Reset	Incremented	When reaching max value

## 7.3 Timers

7.3.1 Timers (Informative)

Timer	Start	Stop	At expiry
T300	Transmission of	Reception of	Perform the actions as specified
NOTE1	RRCConnectionRequest or RRCConnectionResume Request or RRCEarlyDataRequest	RRCConnectionSetup, RRCConnectionReject or RRCConnectionResume or RRCEarlyDataComplete or RRCConnectionRelease for UP- EDT, cell re-selection and upon abortion of connection establishment by upper layers	in 5.3.3.6
T301 NOTE1	Transmission of RRCConnectionReestabil shmentRequest	Reception of RRCConnectionReestablishmen t or RRCConnectionReestablishmen tReject message as well as when the selected cell becomes unsuitable	Go to RRC_IDLE
T302	Reception of <i>RRCConnectionReject</i> while performing RRC connection establishment or reception of <i>RRCConnectionRelease</i> including <i>waitTime</i>	Upon entering RRC_CONNECTED and upon cell re-selection, or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT or upon reception of <i>RRCConnectionReject</i> message for E-UTRA/5GC.	Inform upper layers about barring alleviation as specified in 5.3.3.7
T303	Access barred while performing RRC connection establishment for mobile originating calls	Upon entering RRC_CONNECTED and upon cell re-selection, or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT	Inform upper layers about barring alleviation as specified in 5.3.3.7
T304	Reception of RRCConnectionReconfig uration message including the MobilityControl Info or reception of MobilityFromEUTRACom mand message including CellChangeOrder	Criterion for successful completion of handover within E- UTRA, handover to E-UTRA or cell change order is met (the criterion is specified in the target RAT in case of inter-RAT)	In case of cell change order from E-UTRA or intra E-UTRA handover, initiate the RRC connection re-establishment procedure; In case of handover to E-UTRA, perform the actions defined in the specifications applicable for the source RAT.
T305	Access barred while performing RRC connection establishment for mobile originating signalling	Upon entering RRC_CONNECTED and upon cell re-selection, or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT	Inform upper layers about barring alleviation as specified in 5.3.3.7
T306	Access barred while performing RRC connection establishment for mobile originating CS fallback.	Upon entering RRC_CONNECTED and upon cell re-selection, or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT	Inform upper layers about barring alleviation as specified in 5.3.3.7
T307	Reception of RRCConnectionReconfig uration message including MobilityControlInfoSCG	Successful completion of random access on the PSCell, upon initiating re-establishment and upon SCG release	Initiate the SCG failure information procedure as specified in 5.6.13.
T308	Access barred due to ACDC while performing RRC connection establishment subject to ACDC	Upon entering RRC_CONNECTED and upon cell re-selection, or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT	Inform upper layers about barring alleviation for ACDC as specified in 5.3.3.7

Timer	Start	Stop	At expiry
T309	When access attempt is barred at access barring check for an Access Category. The UE shall maintain one instance of this timer per Access Category.	Upon entering RRC_CONNECTED, upon cell (re)selection, upon reception of <i>RRCConnectionRelease</i> , upon change of PCell while in RRC_CONNECTED, or upon reception of <i>MobilityFromEUTRACommand</i> .	Perform the actions as specified in 5.3.16.4.
T310 NOTE1 NOTE2	Upon detecting physical layer problems for the PCell i.e. upon receiving N310 consecutive out-of- sync indications from lower layers	Upon receiving N311 consecutive in-sync indications from lower layers for the PCell, upon triggering the handover procedure and upon initiating the connection re-establishment procedure	If security is not activated and the UE is not a NB-IoT UE that supports RRC connection re- establishment for the Control Plane CIoT EPS optimisation: go to RRC_IDLE else: initiate the connection re-establishment procedure
T311 NOTE1	Upon initiating the RRC connection re- establishment procedure	Selection of a suitable E-UTRA cell or a cell using another RAT.	Enter RRC_IDLE
T312 NOTE2	Upon triggering a measurement report for a measurement identity for which T312 has been configured, while T310 is running	Upon receiving N311 consecutive in-sync indications from lower layers, upon triggering the handover procedure, upon initiating the connection re-establishment procedure, and upon the expiry of T310	If security is not activated: go to RRC_IDLE else: initiate the connection re-establishment procedure
T313 NOTE2	Upon detecting physical layer problems for the PSCell i.e. upon receiving N313 consecutive out-of-sync indications from lower layers	Upon receiving N314 consecutive in-sync indications from lower layers for the PSCell, upon initiating the connection re- establishment procedure, upon SCG release and upon receiving <i>RRCConnectionReconfiguration</i> including <i>MobilityControlInfoSCG</i>	Inform E-UTRAN about the SCG radio link failure by initiating the SCG failure information procedure as specified in 5.6.13.
T320	Upon receiving <i>t320</i> or upon cell (re)selection to E-UTRA from another RAT with validity time configured for dedicated priorities (in which case the remaining validity time is applied).	Upon entering RRC_CONNECTED, when PLMN selection is performed on request by NAS, when the UE enters RRC_IDLE from RRC_INACTIVE, or upon cell (re)selection to another RAT (in which case the timer is carried on to the other RAT), or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT	Discard the cell reselection priority information provided by dedicated signalling.
T321	Upon receiving <i>measConfig</i> including a <i>reportConfig</i> with the <i>purpose</i> set to <i>reportCGI</i>	Upon acquiring the information needed to set all fields of <i>cellGlobalId</i> for the requested cell, upon receiving <i>measConfig</i> that includes removal of the <i>reportConfig</i> with the <i>purpose</i> set to <i>reportCGI</i> and upon detecting that a cell is not broadcasting SIB1.	Initiate the measurement reporting procedure, stop performing the related measurements and remove the corresponding <i>measId</i>
T322 NOTE1	Upon receiving redirectedCarrierOffsetD edicated included in RedirectedCarrierInfo	Upon entering RRC_CONNECTED, when PLMN selection is performed on request by NAS, or upon cell (re)selection to another RAT, or upon reception of <i>RRCEarlyDataComplete</i> or <i>RRCConnectionRelease</i> for UP- EDT	Release redirectedCarrierOffsetDedicate d.

Timer	Start	Stop	At expiry
T325	Timer (re)started upon receiving <i>RRCConnectionReject</i> message with <i>deprioritisationTimer</i> .		Stop deprioritisation of all frequencies or E-UTRA signalled by <i>RRCConnectionReject.</i>
Т330	Upon receiving LoggedMeasurementCon figuration message	Upon log volume exceeding the suitable UE memory, upon initiating the release of LoggedMeasurementConfigurati on procedure	Perform the actions specified in 5.6.6.4
T331	Upon receiving RRCConnectionRelease message including measIdleConfig.	Upon receiving RRCConnectionSetup, RRCConnectionResume or, if validityArea is configured, upon reselecting to cell that does not belong to validityArea.	Release the stored VarMeasIdleConfig.
T340 NOTE2	Upon transmitting UEAssistanceInformation message with powerPrefIndication set to normal	Upon initiating the connection re-establishment procedure	No action.
T341 NOTE2	Upon transmitting UEAssistanceInformation message with <i>bw</i> - Preference.	Upon resuming an RRC connection or upon initiating the connection re-establishment procedure	No action.
T342 NOTE2	Upon transmitting DelayBudgetReport message.	Upon initiating the connection re-establishment and connection resume procedures	No action.
T350	Upon entering RRC_IDLE if <i>t350</i> has been received in wlan- OffloadInfo.	Upon entering RRC_CONNECTED, or upon cell reselection.	Perform the actions specified in 5.6.12.4.
T351	Reception of RRCConnectionReconfig uration message including the association Timer in WLAN-MobilityConfig.	Upon successful connection to WLAN, upon WLAN connection failure, upon leaving RRC_CONNECTED, upon triggering the handover procedure, or upon initiating the connection re-establishment procedure.	Perform WLAN Connection Status Reporting specified in 5.6.15.2.
T360	Upon performing the redistribution target selection as specified in TS 36.304 [4].	Upon entering RRC_CONNECTED, upon receiving a Paging message including <i>redistributionIndication</i> ; upon reselecting a cell not belonging to the redistribution target.	Stop considering a frequency or cell to be redistribution target, and perform the redistribution target selection if the condition specified in TS 36.304 [4] is met.
T370	Upon receiving SL- DiscConfig including a discSysInfoToReportConf ig set to setup.	Upon initiating the transmission of SidelinkUEInformation including discSysInfoReportFreqList, upon receiving SL-DiscConfig including discSysInfoToReportConfig set to release, upon handover and re-establishment.	Release discSysInfoToReportConfig.
T314 NOTE2	Upon early detecting physical layer problems for the PCell i.e. upon receiving N310 consecutive "early-out-of- sync" indications from lower layers.	Upon receiving N311 consecutive in-sync indications from lower layers for the PCell, upon triggering the handover procedure and upon initiating the connection re-establishment procedure	Initiate the UE Assistance Information procedure to report early detection of physical layer problems in accordance with 5.6.10.

Timer	Start	Stop	At expiry		
T315 NOTE2	Upon detecting physical layer improvements of the PCell i.e. upon receiving N311 consecutive "early-in- sync" indications from lower layers.	Upon receiving N310 consecutive "early-out-of-sync" indications from lower layers for the PCell.	Initiate the UE Assistance Information procedure to report detection of physical layer improvements in accordance with 5.6.10.		
T343 NOTE2	Upon transmitting UEAssistanceInformation message with RLM- Report including earlyOutOfSync.	Upon initiating the connection re-establishment procedure	No action.		
T344 NOTE2	Upon transmitting UEAssistanceInformation message with RLM- Report including earlyInSync.	Upon initiating the connection re-establishment procedure	No action.		
T345	Upon transmitting UEAssistanceInformation message with overheatingAssistance	Upon initiating the connection re-establishment procedure	No action.		
T380	Upon reception of <i>periodic-RNAU-timer</i> in RRCConnectionRelease.	Upon reception of RRCConnectionResume, RRCConnectionRelease or RRCConnectionSetup.	Initiate the RAN notification area update procedure		

## 7.3.2 Timer handling

When the UE applies zero value for a timer, the timer shall be started and immediately expire unless explicitly stated otherwise.

## 7.4 Constants

Constant	Usage
N310	Maximum number of consecutive "out-of-sync" or "early-out-of-sync" indications for the PCell received from lower layers
N311	Maximum number of consecutive "in-sync" or "early-in-sync" indications for the PCell received from lower layers
N313	Maximum number of consecutive "out-of-sync" indications for the PSCell received from lower layers
N314	Maximum number of consecutive "in-sync" indications for the PSCell received from lower layers

## 8 Protocol data unit abstract syntax

## 8.1 General

The RRC PDU contents in clause 6, clause 9.3.2 and clause 10 are described using abstract syntax notation one (ASN.1) as specified in ITU-T Rec. X.680 [13] and X.681 [14]. Transfer syntax for RRC PDUs is derived from their ASN.1 definitions by use of Packed Encoding Rules, unaligned as specified in ITU-T Rec. X.691 [15].

The following encoding rules apply in addition to what has been specified in X.691:

- When a bit string value is placed in a bit-field as specified in 15.6 to 15.11 in X.691, the leading bit of the bit string value shall be placed in the leading bit of the bit-field, and the trailing bit of the bit string value shall be placed in the trailing bit of the bit-field.
- NOTE: The terms 'leading bit' and 'trailing bit' are defined in ITU-T Rec. X.680. When using the 'bstring' notation, the leading bit of the bit string value is on the left, and the trailing bit of the bit string value is on the right.
- When decoding types constrained with the ASN.1 Contents Constraint ("CONTAINING"), automatic decoding of the contained type should not be performed because errors in the decoding of the contained type should not cause the decoding of the entire RRC message PDU to fail. It is recommended that the decoder first decodes the outer PDU type that contains the OCTET STRING or BIT STRING with the Contents Constraint, and then decodes the contained type that is nested within the OCTET STRING or BIT STRING as a separate step.
- When decoding a) RRC message PDUs, b) BIT STRING constrained with a Contents Constraint, or c) OCTET STRING constrained with a Contents Constraint, PER decoders are required to never report an error if there are extraneous zero or non-zero bits at the end of the encoded RRC message PDU, BIT STRING or OCTET STRING.

## 8.2 Structure of encoded RRC messages

An RRC PDU, which is the bit string that is exchanged between peer entities/ across the radio interface contains the basic production as defined in X.691.

RRC PDUs shall be mapped to and from PDCP SDUs (in case of DCCH) or RLC SDUs (in case of PCCH, BCCH, BR-BCCH, CCCH or MCCH) upon transmission and reception as follows:

- when delivering an RRC PDU as an PDCP SDU to the PDCP layer for transmission, the first bit of the RRC PDU shall be represented as the first bit in the PDCP SDU and onwards; and
- when delivering an RRC PDU as an RLC SDU to the RLC layer for transmission, the first bit of the RRC PDU shall be represented as the first bit in the RLC SDU and onwards; and
- upon reception of an PDCP SDU from the PDCP layer, the first bit of the PDCP SDU shall represent the first bit of the RRC PDU and onwards; and
- upon reception of an RLC SDU from the RLC layer, the first bit of the RLC SDU shall represent the first bit of the RRC PDU and onwards.

## 8.3 Basic production

The 'basic production' is obtained by applying UNALIGNED PER to the abstract syntax value (the ASN.1 description) as specified in X.691. It always contains a multiple of 8 bits.

## 8.4 Extension

The following rules apply with respect to the use of protocol extensions:

- A transmitter compliant with this version of the specification shall, unless explicitly indicated otherwise on a PDU type basis, set the extension part empty. Transmitters compliant with a later version may send non-empty extensions;
- A transmitter compliant with this version of the specification shall set spare bits to zero;

## 8.5 Padding

If the encoded RRC message does not fill a transport block, the RRC layer shall add padding bits. This applies to PCCH, BCCH and BR-BCCH.

Padding bits shall be set to 0 and the number of padding bits is a multiple of 8.

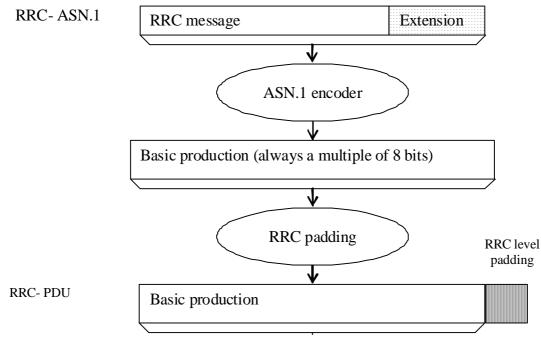


Figure 8.5-1: RRC level padding

# 9 Specified and default radio configurations

Specified and default configurations are configurations of which the details are specified in the standard. Specified configurations are fixed while default configurations can be modified using dedicated signalling.

## 9.1 Specified configurations

## 9.1.1 Logical channel configurations

## 9.1.1.1 BCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	ТМ		
MAC configuration	ТМ		

NOTE: RRC will perform padding, if required due to the granularity of the TF signalling, as defined in 8.5.

## 9.1.1.2 CCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	ТМ		

Name	Value	Semantics description	Ver
MAC configuration		Normal MAC headers are used	
Logical channel configuration			
priority	1	Highest priority	
prioritisedBitRate	infinity		
bucketSizeDuration	N/A		
logicalChannelGroup	0		
logicalChannelSR-Mask-r9	release		v920

## 9.1.1.3 PCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	ТМ		
MAC configuration	ТМ		

NOTE: RRC will perform padding, if required due to the granularity of the TF signalling, as defined in 8.5.

## 9.1.1.4 MCCH and MTCH configuration

## Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	UM		
sn-FieldLength	size5		
t-Reordering	0		

## 9.1.1.5 SBCCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	TM		
MAC configuration	TM		

NOTE: RRC will perform padding, if required due to the granularity of the TF signalling, as defined in 8.5.

## 9.1.1.6 STCH configuration

Parameters

Name	Value	Semantics description	Ver
PDCP configuration			
discardTimer	Undefined	Up to UE implementation	
pdcp-SN-Size	16		
maxCID	15		
profiles			
t-Reordering (PDCP)	Undefined	Only used for V2X sidelink communication. Selected by the receiving UE, up to UE implementation	V1520
RLC configuration		Uni-directional UM RLC UM window size is set to 0	
		Uni-directional UM RLC UM window size is set to 0 for sidelink communication	v1440
sn-FieldLength	5		
logicalChannelIdentity	Undefined	Selected by the transmitting UE, up to UE implementation	
Logical channel configuration			
priority	Undefined	Selected by the transmitting UE, up to UE implementation	
prioritisedBitRate	Undefined	Selected by the transmitting UE, up to UE implementation	
bucketSizeDuration	Undefined	Selected by the transmitting UE, up to UE implementation	
logicalChannelGroup	3		
t-Reordering	Undefined	Only used for V2X sidelink communication. Selected by the receiving UE, up to UE implementation	v1440
MAC configuration			

## 9.1.1.7 SC-MCCH and SC-MTCH configuration

## Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	UM		
sn-FieldLength	size5		
t-Reordering	0		

## 9.1.1.8 BR-BCCH configuration

## Parameters

Name	Value	Semantics description	Ver
PDCP configuration	N/A		
RLC configuration	ТМ		
MAC configuration	ТМ		

NOTE: RRC will perform padding, if required due to the granularity of the TF signalling, as defined in 8.5.

## 9.1.2 SRB configurations

## 9.1.2.1 SRB1

Parameters

Name	Value	Semantics description	Ver
RLC configuration			
logicalChannelIdentity	1		

## 9.1.2.1a SRB1bis

Parameters

Name	Value	Semantics description	Ver
RLC configuration			
logicalChannelIdentity	3		

## 9.1.2.2 SRB2

#### Parameters

Name	Value	Semantics description	Ver
RLC configuration			
logicalChannelIdentity	2		

## 9.1.2.3 SRB4

Parameters

Name	Value	Semantics description	Ver
RLC configuration			
logicalChannelIdentity	4		

## 9.2 Default radio configurations

The following clauses only list default values for REL-8 parameters included in protocol version v8.5.0. For all fields introduced in a later protocol version, the default value is "released" unless explicitly specified otherwise. If UE is to apply default configuration while it is configured with some critically extended fields, the UE shall apply the original version with only default values. For the following fields, introduced in a protocol version later than v8.5.0, the default corresponds with "value not applicable":

- codeBookSubsetRestriction-v920;
- pmi-RI-Report;
- NOTE 1: Value "N/A" indicates that the UE does not apply a specific value (i.e. upon switching to a default configuration, E-UTRAN can not assume the UE keeps the previously configured value). This implies that E-UTRAN needs to configure a value before invoking the related functionality.
- NOTE 2: In general, the signalling should preferably support a "release" option for fields introduced after v8.5.0. The "value not applicable" should be used restrictively, mainly limited to for fields which value is relevant only if another field is set to a value other than its default.

# 9.2.1 SRB configurations

## 9.2.1.1 SRB1

## Parameters

Name	Value	NB-IoT	Semantics description	Ver
RLC configuration CHOICE	am	am		
ul-RLC-Config				
>t-PollRetransmit	ms45	ms25000		
>pollPDU	infinity	N/A		
>pollByte	infinity	N/A		
>maxRetxThreshold	t4	t4		
dl-RLC-Config				
>t-Reordering	ms35	released		
>t-StatusProhibit	ms0	N/A		
>enableStatusReportSN-Gap	N/A	disabled		
Logical channel configuration				
priority	1	1	Highest priority	
prioritisedBitRate	infinity	N/A		
bucketSizeDuration	N/A	N/A		
logicalChannelGroup	0	N/A		
logicalChannelSR-Prohibit	N/A	TRUE		

## 9.2.1.2 SRB2

#### Parameters

Name	Value	Semantics description	Ver
RLC configuration CHOICE	am		
ul-RLC-Config			
>t-PollRetransmit	ms45		
>pollPDU	infinity		
>pollByte	infinity		
>maxRetxThreshold	t4		
dl-RLC-Config			
>t-Reordering	ms35		
>t-StatusProhibit	ms0		
Logical channel configuration			

Name	Value	Semantics description	Ver
priority	3		
prioritisedBitRate	infinity		
bucketSizeDuration	N/A		
logicalChannelGroup	0		

# 9.2.2 Default MAC main configuration

Parameters

Name	Value	NB-IoT	Semantics description	Ver
MAC main configuration				
maxHARQ-tx	n5	N/A		
periodicBSR-Timer	infinity	pp8		
retxBSR-Timer	sf2560	infinity		
ttiBundling	FALSE	N/A		
drx-Config	release	N/A		
phr-Config	release	N/A		

# 9.2.3 Default semi-persistent scheduling configuration

SPS-Config		
>sps-ConfigDL	release	
>sps-ConfigUL	release	

# 9.2.4 Default physical channel configuration

Parameters (not applicable for NB-IoT)

Name	Value	Semantics description	Ver
PDSCH-ConfigDedicated			
> <i>p</i> - <i>a</i>	dB0		
PUCCH-ConfigDedicated			
>tdd-AckNackFeedbackMode	bundling	Only valid for TDD mode	
>ackNackRepetition	release		
PUSCH-ConfigDedicated			
>betaOffset-ACK-Index	10		
>betaOffset-RI-Index	12		
>betaOffset-CQI-Index	15		

Name	Value	Semantics description	Ver
UplinkPowerControlDedicated			
>p0-UE-PUSCH	0		
>deltaMCS-Enabled	en0 (disabled)		
>accumulationEnabled	TRUE		
>p0-UE-PUCCH	0		
>pSRS-Offset	7		
>filterCoefficient	fc4		
tpc-pdcch-ConfigPUCCH	release		
tpc-pdcch-ConfigPUSCH	release		
CQI-ReportConfig			
>CQI-ReportPeriodic	release		
>cqi-ReportModeAperiodic	N/A		
>nomPDSCH-RS-EPRE-Offset	N/A		
SoundingRS-UL-ConfigDedicated	release		
AntennaInfoDedicated			
>transmissionMode	tm1, tm2	If the number of PBCH antenna ports is one, tm1 is used as default; otherwise tm2 is used as default	
>codebookSubsetRestriction	N/A		
>ue-TransmitAntennaSelection	release		
SchedulingRequestConfig	release		

#### Parameters applicable for NB-IoT

Name	Value	Semantics description	Ver
NPUSCH-ConfigDedicated-NB			
>ack-NACK-NumRepetitions	N/A		
>npusch-AllSymbols	TRUE		
UplinkPowerControlDedicated			
>p0-UE-NPUSCH	0		

# 9.2.5 Default values timers and constants

Parameters

Name	Value	Semantics description	Ver
t310	ms1000		
n310	n1		
t311	ms1000		
n311	n1		

# 9.3 Sidelink pre-configured parameters

## 9.3.1 Specified parameters

This clause only list parameters which value is specified in the standard.

#### Parameters

-- ASN1START

Name	Value	Semantics description	Ver
preconfigSync			
>syncTxParameters			
>>alpha	0		
preconfigComm			
>sc-TxParameters			
>>alpha	0		
>dataTxParameters			
>>alpha	0		
v2x-CommPreconfigSync			
>syncTxParameters			
>>alpha	0		
v2x-CommTxPoolList, p2x-			
CommTxPoolList			
>dataTxParameters			
>>alpha	0		

## 9.3.2 Pre-configurable parameters

This ASN.1 segment is the start of the E-UTRA definitions of pre-configured sidelink parameters.

NOTE 1: Upper layers are assumed to provide a set of pre-configured parameters that are valid at the current UE location if any, see TS 24.334 [69], clause 10.2.

```
EUTRA-Sidelink-Preconf DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
IMPORTS
   AdditionalSpectrumEmission,
    AdditionalSpectrumEmission-v1010,
   ARFCN-ValueEUTRA-r9,
   FilterCoefficient,
   maxCBR-Level-r14,
   maxCBR-Level-1-r14,
   maxFreq,
   maxFreqV2X-r14,
   maxSL-TxPool-r12,
   maxSL-CommRxPoolPreconf-v1310,
   maxSL-CommTxPoolPreconf-v1310,
   maxSL-DiscRxPoolPreconf-r13,
   maxSL-DiscTxPoolPreconf-r13,
   maxSL-V2X-CBRConfig2-r14,
    maxSL-V2X-CBRConfig2-1-r14,
   maxSL-V2X-RxPoolPreconf-r14,
```

```
maxSL-V2X-TxConfig2-r14,
    maxSL-V2X-TxConfig2-1-r14,
   maxSL-V2X-TxPoolPreconf-r14,
   MCS-PSSCH-Range-r15,
    P-Max,
    ReselectionInfoRelay-r13,
    SL-AnchorCarrierFreqList-V2X-r14,
    SL-CBR-Levels-Config-r14,
    SL-CBR-PSSCH-TxConfig-r14,
    SL-CommTxPoolSensingConfig-r14,
    SL-CP-Len-r12,
    SL-HoppingConfigComm-r12,
    SL-OffsetIndicator-r12,
    SL-OffsetIndicatorSync-r12,
    SL-OffsetIndicatorSync-v1430,
    SL-PeriodComm-r12,
    RSRP-RangeSL3-r12,
    SL-MinT2ValueList-r15,
    SL-PriorityList-r13,
    SL-TF-ResourceConfig-r12,
    SL-TRPT-Subset-r12,
    SL-TxParameters-r12,
    SL-ZoneConfig-r14,
    PO-SL-r12,
    TDD-ConfigSL-r12,
    SubframeBitmapSL-r14,
    SL-P2X-ResourceSelectionConfig-r14,
    SL-RestrictResourceReservationPeriodList-r14,
    SL-SyncAllowed-r14,
    SL-OffsetIndicatorSync-r14,
    SL-Priority-r13,
    SL-V2X-FreqSelectionConfigList-r15,
    SL-V2X-PacketDuplicationConfig-r15,
    SL-V2X-SyncFreqList-r15
FROM EUTRA-RRC-Definitions;
```

```
-- ASN1STOP
```

#### SL-Preconfiguration

The IE SL-Preconfiguration includes the sidelink pre-configured parameters.

#### SL-Preconfiguration information elements

```
-- ASN1START
SL-Preconfiguration-r12 ::= SEQUENCE {
    preconfigGeneral-r12
                                SL-PreconfigGeneral-r12,
    preconfigSync-r12
                                          SL-PreconfigSync-r12,
    preconfigComm-r12
                                        SL-PreconfigCommPoolList4-r12,
            configComm-v1310SEQUENCE {commRxPoolList-r13SL-PreconfigCommRxPoolList-r13,commTxPoolList-r13SL-PreconfigCommTxPoolList-r13,
    [[ preconfigComm-v1310
                                                                                OPTIONAL
        }
                                                                                    OPTIONAL,
        preconfigDisc-r13
                                        SEQUENCE {
            discRxPoolList-r13
                                              SL-PreconfigDiscRxPoolList-r13,
            discTxPoolList-r13
                                              SL-PreconfigDiscTxPoolList-r13
                                                                                    OPTIONAL
                                                                                     OPTIONAL,
        preconfigRelay-r13
                                         SL-PreconfigRelay-r13
                                                                               OPTIONAL
    11
}
SL-PreconfigGeneral-r12 ::=
                                 SEQUENCE {
    -- PDCP configuration
    rohc-Profiles-r12
                                          SEQUENCE {
                                                  BOOLEAN,
        profile0x0001-r12
        profile0x0002-r12
                                                  BOOLEAN.
        profile0x0004-r12
                                                  BOOLEAN,
        profile0x0006-r12
                                                  BOOLEAN,
        profile0x0101-r12
                                                  BOOLEAN,
        profile0x0102-r12
                                                  BOOLEAN,
        profile0x0104-r12
                                                  BOOLEAN
```

```
},
    -- Physical configuration
                                       ARFCN-ValueEUTRA-r9,
   carrierFreq-r12
                                       P-Max,
   maxTxPower-r12
    additionalSpectrumEmission-r12
                                       AdditionalSpectrumEmission,
    sl-bandwidth-r12
                                       ENUMERATED {n6, n15, n25, n50, n75, n100},
    tdd-ConfigSL-r12
                                        TDD-ConfigSL-r12,
                                        BIT STRING (SIZE (19)),
   reserved-r12
    [[
       additionalSpectrumEmission-v1440
                                               AdditionalSpectrumEmission-v1010
                                                                                       OPTIONAL
    ]]
}
SL-PreconfigSync-r12 ::= SEQUENCE {
   syncCP-Len-r12
                                        SL-CP-Len-r12,
    syncOffsetIndicator1-r12
                                       SL-OffsetIndicatorSync-r12,
    syncOffsetIndicator2-r12
                                       SL-OffsetIndicatorSync-r12,
    syncTxParameters-r12
                                       P0-SL-r12,
    syncTxThreshOoC-r12
                                      RSRP-RangeSL3-r12,
                                     FilterCoefficient,
ENUMERATED {dB0, dB3, dB6, dB9, dB12},
    filterCoefficient-r12
    syncRefMinHyst-r12
    syncRefDiffHyst-r12
                                      ENUMERATED {dB0, dB3, dB6, dB9, dB12, dBinf},
    [[ syncTxPeriodic-r13
                                           ENUMERATED {true}
                                                                       OPTIONAL
    11
}
SL-PreconfigCommPoolList4-r12 ::= SEQUENCE (SIZE (1..maxSL-TxPool-r12)) OF SL-PreconfigCommPool-
r12
SL-PreconfigCommRxPoolList-r13 ::= SEQUENCE (SIZE (1..maxSL-CommRxPoolPreconf-v1310)) OF SL-
PreconfigCommPool-r12
SL-PreconfigCommTxPoolList-r13 ::= SEQUENCE (SIZE (1..maxSL-CommTxPoolPreconf-v1310)) OF SL-
PreconfigCommPool-r12
SL-PreconfigCommPool-r12 ::=
                                SEQUENCE {
-- This IE is same as SL-CommResourcePool with rxParametersNCell absent
    sc-CP-Len-r12
                                       SL-CP-Len-r12,
    sc-Period-r12
                                        SL-PeriodComm-r12,
    sc-TF-ResourceConfig-r12
                                        SL-TF-ResourceConfig-r12,
    sc-TxParameters-r12
                                       P0-SL-r12.
   data-CP-Len-r12
                                       SL-CP-Len-r12,
   data-TF-ResourceConfig-r12
                                       SL-TF-ResourceConfig-r12,
   dataHoppingConfig-r12
                                       SL-HoppingConfigComm-r12,
   dataTxParameters-r12
                                        PO-SL-r12,
    trpt-Subset-r12
                                       SL-TRPT-Subset-r12,
    ]]]
      priorityList-r13
                                       SL-PriorityList-r13
                                                                   OPTIONAL -- For Tx
   ]]
}
SL-PreconfigDiscRxPoolList-r13 ::= SEQUENCE (SIZE (1..maxSL-DiscRxPoolPreconf-r13)) OF SL-
PreconfigDiscPool-r13
SL-PreconfigDiscTxPoolList-r13 ::= SEQUENCE (SIZE (1..maxSL-DiscTxPoolPreconf-r13)) OF SL-
PreconfigDiscPool-r13
SL-PreconfigDiscPool-r13 ::= SEQUENCE {
-- This IE is same as SL-DiscResourcePool with rxParameters absent
    cp-Len-r13
                                  SL-CP-Len-r12,
    discPeriod-r13
                               ENUMERATED {rf4, rf6, rf7, rf8, rf12, rf14, rf16, rf24, rf28,
                                      rf32, rf64, rf128, rf256, rf512, rf1024, spare},
                               INTEGER (0..3),
   numRetx-r13
   numRepetition-r13
    tf-ResourceConfig-r13 SL-TF-ResourceConfig-r13
                                   SL-TF-ResourceConfig-r12,
       arametersDigotantetxParametersGeneral-r13P0-SL-r12,txProbability-r13ENUMERATED {p25, p50, p75, p100}
    }
                                                                    OPTIONAL.
    . . .
}
SL-PreconfigRelay-r13 ::= SEQUENCE {
   reselectionInfoOoC-r13
                                   ReselectionInfoRelay-r13
}
-- ASN1STOP
```

SL-Preconfiguration field descriptions
carrierFreq
Indicates the carrier frequency for out of coverage sidelink communication and sidelink discovery. In case of FDD it is uplink carrier frequency and the corresponding downlink frequency can be determined from the default TX-RX frequency separation defined in TS 36.101 [42], table 5.7.3-1.
additionalSpectrumEmission
The UE requirements related to IE AdditionalSpectrumEmission are defined in TS 36.101 [42], clause 6.2.4. If additionalSpectrumEmissionExt-r14 is configured, the UE only considers additionalSpectrumEmissionExt-r14 (and ignores additionalSpectrumEmission-r12).
commRxPoolList
Indicates a list of reception pools for sidelink communication in addition to the resource pools indicated by
preconfigComm.
<i>commTxPoolList</i> Indicates a list of transmission pools for sidelink communication in addition to the first resource pool within <i>preconfigComm</i> .
preconfigComm
Indicates a list of resource pools. The first resource pool in the list is used for both reception and transmission of sidelink communication. The other resource pools, if present, are only used for reception of sidelink communication.
syncRefDiffHyst
Hysteresis when evaluating a SyncRef UE using relative comparison. Value <i>dB0</i> corresponds to 0 dB, <i>dB3</i> to 3 dB and so on, value <i>dBinf</i> corresponds to infinite dB.
syncRefMinHyst
Hysteresis when evaluating a SyncRef UE using absolute comparison. Value <i>dB0</i> corresponds to 0 dB, <i>dB3</i> to 3 dB and so on.

- NOTE 1: The network may configure one or more of the reception only resource pools in *preconfigComm* to cover reception from in coverage UEs using scheduled resource allocation. For such a resource pool the network should set all bits of *subframeBitmap* to 1 and *offsetIndicator* to indicate the subframe immediately following the sidelink control information.
- NOTE 2: The network should ensure that the resources defined by the first entry in *preconfigComm* (used for transmission by an out of coverage UE) do not overlap with those of the pool(s) covering scheduled transmissions by in coverage UEs. Furthermore, the network should ensure that for none of the entries in *preconfigComm* the resources defined by *sc-TF-ResourceConfig* overlap.

#### SL-V2X-Preconfiguration

The IE *SL-V2X-Preconfiguration* includes the sidelink pre-configured parameters used for V2X sidelink communication.

#### SL-V2X-Preconfiguration information elements

```
-- ASN1START
SL-V2X-Preconfiguration-r14 ::= SEQUENCE {
    v2x-PreconfigFreqList-r14 SL-V2X-PreconfigFreqList-r14,
anchorCarrierFreqList-r14 SL-AnchorCarrierFreqList-V2X-r14
cbr-PreconfigList-r14 SL-CBR-PreconfigTxConfigList-r14
                                                                                                         OPTIONAL,
                                                                                                         OPTIONAL,
     ...,
[[ v2x-PacketDuplicationConfig-r15 SL-V2X-PacketDuplicationConfig-r15
                                                                                                         OPTIONAL,
          syncFreqList-r15SL-V2X-SyncFreqList-r15slss-TxMultiFreq-r15ENUMERATED {true}v2x-TxProfileList-r15SL-V2X-TxProfileList-r15
                                                                                                    OPTIONAL,
                                                                                                    OPTIONAL,
                                                                                                    OPTIONAL
     11
}
SL-CBR-PreconfigTxConfigList-r14 ::=
                                                  SEQUENCE {
     cbr-RangeCommonConfigList-r14 SEQUENCE (SIZE (1..maxSL-V2X-CBRConfig2-r14)) OF SL-CBR-Levels-
Config-r14,
     sl-CBR-PSSCH-TxConfigList-r14 SEQUENCE (SIZE (1..maxSL-V2X-TxConfig2-r14)) OF SL-CBR-PSSCH-
TxConfig-r14
}
SL-V2X-PreconfigFreqList-r14 ::=
                                          SEQUENCE (SIZE (1..maxFreqV2X-r14)) OF SL-V2X-PreconfigFreqInfo-
r14
```

SL-V2X-PreconfigFreqInfo-r14 ::= SEQUENCE { v2x-CommPreconfigGeneral-r14 SL-PreconfigGeneral-r12, v2x-CommPreconfigSync-r14 SL-PreconfigV2X-Sync-r14 OPTIONAL, v2x-CommRxPoolList-r14 SL-PreconfigV2X-RxPoolList-r14, v2x-CommTxPoolList-r14 SL-PreconfigV2X-TxPoolList-r14, SL-PreconfigV2X-TxPoolList-r14, p2x-CommTxPoolList-r14 SL-CommTxPoolSensingConfig-r14 v2x-ResourceSelectionConfig-r14 OPTIONAL. SL-ZoneConfig-r14 zoneConfig-r14 OPTIONAL, syncPriority-r14 ENUMERATED {gnss, enb}, thresSL-TxPrioritization-r14 SL-Priority-r13 OPTIONAL, offsetDFN-r14 INTEGER (0..1000) OPTIONAL, [[ v2x-FreqSelectionConfigList-r15 SL-V2X-FreqSelectionConfigList-r15 OPTIONAL ]] } SL-PreconfigV2X-RxPoolList-r14 ::= SEQUENCE (SIZE (1..maxSL-V2X-RxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 SL-PreconfigV2X-TxPoolList-r14 ::= SEQUENCE (SIZE (1..maxSL-V2X-TxPoolPreconf-r14)) OF SL-V2X-PreconfigCommPool-r14 SL-V2X-PreconfigCommPool-r14 ::= SEQUENCE { -- This IE is same as SL-CommResourcePoolV2X with rxParametersNCell absent sl-OffsetIndicator-r14 SL-OffsetIndicator-r12 OPTIONAL. sl-Subframe-r14 SubframeBitmapSL-r14, adjacencyPSCCH-PSSCH-r14 BOOLEAN, sizeSubchannel-r14 ENUMERATED { n4, n5, n6, n8, n9, n10, n12, n15, n16, n18, n20, n25, n30, n48, n50, n72, n75, n96, n100, spare13, spare12, spare11, spare10, spare9, spare8, spare7, spare6, spare5, spare4, spare3, spare2, spare1}, numSubchannel-r14 ENUMERATED {n1, n3, n5, n8, n10, n15, n20, sparel}, INTEGER (0..99), startRB-Subchannel-r14 startRB-PSCCH-Pool-r14 INTEGER (0..99) OPTIONAL, dataTxParameters-r14 PO-SL-r12, zoneID-r14 INTEGER (0..7) OPTIONAL, threshS-RSSI-CBR-r14 INTEGER (0..45) OPTIONAL, thresh5-k551-CBR-114 cbr-pssch-TxConfigList-r14 resourceSelectionConfigP2X-r14 SL-P2X-ResourceSelectionConfig-r14 OPTIONAL, Chrennik (1997) SL-P2X-ResourceSelectionConfig-r14 OPTIONAL, syncAllowed-r14 SL-SyncAllowed-r14 OPTIONAL. restrictResourceReservationPeriod-r14 SL-RestrictResourceReservationPeriodList-r14 OPTIONAL, [[ sl-MinT2ValueList-r15 SL-MinT2ValueList-r15 OPTIONAL, cbr-pssch-TxConfigList-v1530 SL-CBR-PPPP-TxPreconfigList-v1530 OPTIONAL 11 } SL-PreconfigV2X-Sync-r14 ::= SEQUENCE { syncOffsetIndicators-r14 SL-V2X-SyncOffsetIndicators-r14, syncTxParameters-r14 PO-SL-r12, syncTxThreshOoC-r14 RSRP-RangeSL3-r12, FilterCoefficient, filterCoefficient-r14 ENUMERATED {dB0, dB3, dB6, dB9, dB12}, syncRefMinHyst-r14 ENUMERATED {dB0, dB3, dB6, dB9, dB12, dBinf}, syncRefDiffHyst-r14 [[ slss-TxDisabled-r15 ENUMERATED {true} OPTIONAL 11 } SL-V2X-SyncOffsetIndicators-r14 ::= SEQUENCE { syncOffsetIndicator1-r14 SL-OffsetIndicatorSync-r14, syncOffsetIndicator2-r14 syncOffsetIndicator3-r14 SL-OffsetIndicatorSync-r14, SL-OffsetIndicatorSync-r14 OPTIONAL. } SL-CBR-PPPP-TxPreconfigList-r14 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxPreconfigIndex-r14 SL-PPPP-TxPreconfigIndex-r14 ::= SEQUENCE { priorityThreshold-r14 SL-Priority-r13, priorityThreshold-r14 defaultTxConfigIndex-r14 cbr-ConfigIndex-r14 INTEGER(0..maxCBR-Level-1-r14), INTEGER(0..maxSL-V2X-CBRConfig2-1-r14), SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF Tx-PreconfigIndex-r14 tx-ConfigIndexList-r14 } Tx-PreconfigIndex-r14 ::= INTEGER(0., maxSL-V2X-TxConfig2-1-r14)

SL-CBR-PPPP-TxPreconfigList-v1530 ::= SEQUENCE (SIZE (1..8)) OF SL-PPPP-TxPreconfigIndex-v1530
SL-PPPP-TxPreconfigIndex-v1530 ::= SEQUENCE {
 mcs-PSSCH-Range-r15 SEQUENCE (SIZE (1..maxCBR-Level-r14)) OF MCS-PSSCH-Range-r15
 OPTIONAL
}
SL-V2X-TxProfileList-r15 ::= SEQUENCE (SIZE (1..256)) OF SL-V2X-TxProfile-r15
SL-V2X-TxProfile-r15 ::= ENUMERATED {
 rel14, rel15, spare6, spare5, spare4, spare3, spare2, spare1, ...}
END
-- ASN1STOP

	SL-V2X-Preconfiguration field descriptions
adjacencyPSCCH-PSSCH	
PSCCH and PSSCH in nor	vays transmits PSCCH and PSSCH in adjacent RBs (indicated by TRUE) or it may transmin-adjacent RBs (indicated by FALSE). This parameter appears only when a pool is
<u> </u>	transmits PSCCH and the associated PSSCH in the same subframe.
anchorCarrierFreqList	
	es which may include inter-carrier resource configuration for V2X sidelink communication.
cbr-PreconfigList	
configure congestion control	I list of CBR ranges and the list of PSSCH transmission configurations available to of to the UE for V2X sidelink communication.
cbr-pssch-TxConfigList	
	veen PPPPs, CBR ranges by using indexes of the entry in <i>cbr-RangeCommonConfigList</i> in CH transmission parameters and CR limits by using indexes of the entry in <i>sl-CBR-</i> <i>r-PreconfigLis</i> t.
numSubchannel	
Indicates the number of su	bchannels in the corresponding resource pool.
offsetDFN	
Indicates the timing offset f	or the UE to determine DFN timing when GNSS is used for timing reference. Value 0 nds, value 1 corresponds to 0.001 milliseconds, value 2 corresponds to 0.002 milliseconds
resourceSelectionConfig	DOV
	rca selection mechanism(s), i.e. partial sensing and/or random selection, for P2X related
V2X sidelink communicatio	n.
restrictResourceReserva	
for transmission on this poo	ictResourceReservationPeriod configured in v2x-ResourceSelectionConfig shall be ignore bl.
sizeSubchannel	
	Bs of each subchannel in the corresponding resource pool. The value n5 denotes 5 PRBs
	on. The values n5, n6, n10, n15, n20, n25, n50, n75 and n100 apply in the case of
adjacencyPSCCH-PSSCH	set to TRUE; the values n4, n5, n6, n8, n9, n10, n12, n15, n16, n18, n20, n30, n48, n72
and n96 apply in the case of	of adjacencyPSCCH-PSSCH set to FALSE.
sl-OffsetIndicator	
	rst subframe of a resource pool within a SFN cycle. If absent, the resource pool starts fror his field is not applicable to V2X sidelink communication.
sl-Subframe	
Indicates the bitmap of the 36.213 [23]).	resource pool, which is is defined by repeating the bitmap within a SFN cycle (see TS
startRB-Subchannel	
	lex of the subchannel with the lowest index.
startRB-PSCCH-Pool	
Indicates the lowest RB inc	lex of the PSCCH pool
syncAllowed	
	archization reference(a) which is (arc) allowed to use the pro-configured recourse pool
	nronization reference(s) which is (are) allowed to use the pre-configured resource pool.
configuration on the carrier over the UE directly synchr	on priority order. In case the UE does not detect any cell which configures synchronization frequency in <i>anchorCarrierFreqList</i> , if this field is set to <i>gnss</i> , the UE shall prioritize GNSS onized to eNB; if this field is set to <i>enb</i> , the UE shall prioritize the UE directly synchronized
to eNB over GNSS.	
thresSL-TxPrioritization	
	d to determine whether SL V2X transmission is prioritized over uplink transmission if they
overlap in time (see TS 36.	321 [6]).
threshS-RSSI-CBR	
specified in TS 36.214 [48]	hold for determining the contribution of a sub-channel to the CBR measurement, as . Value 0 corresponds to -112 dBm, value 1 to -110 dBm, value n to (-112 + n*2) dBm, and
so on.	
v2x-CommRxPoolList	
	pools for V2X sidelink communication.
v2x-CommTxPoolList	
Indicates a list of transmiss	ion pools for V2X sidelink communication.
v2x-ResourceSelectionC	onfia
vzx-nesourceselections	g

#### v2x-TxProfileList

SL-V2X-Preconfiguration field descriptions

Indicates for each Tx profile the corresponding transmission format, used as specified in TS 36.321 [6], in order of increasing Tx profile pointer identities. For each entry, Value REL14 indicates that the UE shall use Release 14 compatible format (i.e. using MCS table in Table 8.6.1-1 with 64 QAM indices overridden by 16QAM in TS 36.213 [23] and not Rel-15 feature) to transmit the corresponding V2X packet. Value REL15 indicates that the UE shall use Release 15 format (i.e. using rate matching, TBS scaling, MCS table in Table 8.6.1 and, if applicable, the MCS indices supporting 64QAM in Table 8.6.1 and Table 14.1.1-2 in TS 36.213 [23]) to transmit the corresponding V2X packet. If *v2x-TxProfileList* is not configured by upper layers, the UE shall use Release 14 compatible format to transmit the corresponding V2X packet.

#### zoneConfig

Indicates zone configurations used for V2X sidelink communication in 5.10.13.2.

#### zonelD

Indicates the zone ID for which the UE shall use this resource pool as described in 5.10.13.2. The field is absent in v2x-CommRxPoolList and p2x-CommTxPoolList in SL-V2X-PreconfigFreqInfo.

# 10 Radio information related interactions between network nodes

# 10.1 General

This clause specifies RRC messages that are transferred between network nodes. These RRC messages may be transferred to or from the UE via another Radio Access Technology. Consequently, these messages have similar characteristics as the RRC messages that are transferred across the E-UTRA radio interface, i.e. the same transfer syntax and protocol extension mechanisms apply.

# 10.2 Inter-node RRC messages

## 10.2.1 General

This clause specifies RRC messages that are sent either across the X2- or the S1-interface, either to or from the eNB, i.e. a single 'logical channel' is used for all RRC messages transferred across network nodes. The information could originate from or be destined for another RAT.

## EUTRA-InterNodeDefinitions

This ASN.1 segment is the start of the E-UTRA inter-node PDU definitions.

-- ASN1START

EUTRA-InterNodeDefinitions DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

IMPORTS

```
AntennaInfoCommon,
AntennaInfoDedicated-v10i0,
ARFCN-ValueEUTRA,
ARFCN-ValueEUTRA-v9e0,
ARFCN-ValueEUTRA-r9,
CellIdentity,
C-RNTI,
DL-DCCH-Message,
DRB-Identity,
DRB-ToReleaseList,
DRB-ToReleaseList-r15,
FregBandIndicator-r11,
InDeviceCoexIndication-r11,
LWA-Config-r13,
MasterInformationBlock,
maxBands,
```

maxFreq, maxDRB, maxDRBExt-r15, maxDRB-r15, maxSCell-r10, maxSCell-r13, maxServCell-r10, maxServCell-r13 MBMSInterestIndication-r11, MeasConfig, MeasGapConfig, MeasGapConfigPerCC-List-r14, MeasResultForRSSI-r13, MeasResultListWLAN-r13, OtherConfig-r9, PhysCellId, P-Max, PowerCoordinationInfo-r12, SidelinkUEInformation-r12, SL-CommConfig-r12, SL-DiscConfig-r12, SubframeAssignment-r15, RadioResourceConfigDedicated, RadioResourceConfigDedicated-v13c0, RadioResourceConfigDedicated-v1370, RAN-NotificationAreaInfo-r15, RCLWI-Configuration-r13, RSRP-Range, RSRQ-Range, RSRQ-Range-v1250, RS-SINR-Range-r13, SCellToAddModList-r10, SCellToAddModList-v13c0, SCellToAddModListExt-r13 SCellToAddModListExt-v13c0, SCG-ConfigPartSCG-r12, SCG-ConfigPartSCG-v12f0, SCG-ConfigPartSCG-v13c0, SecurityAlgorithmConfig, SCellIndex-r10, SCellIndex-r13, SCellToReleaseList-r10, SCellToReleaseListExt-r13, ServCellIndex-r10, ServCellIndex-r13, ShortMAC-I, MeasResultServFreqListNR-r15, MeasResultSSTD-r13, SL-V2X-ConfigDedicated-r14, SystemInformationBlockType1, SystemInformationBlockType1-v890-IEs, SystemInformationBlockType2, UEAssistanceInformation-r11, UECapabilityInformation, UE-CapabilityRAT-ContainerList, UE-RadioPagingInfo-r12, WLANConnectionStatusReport-r13, WLAN-OffloadConfig-r12 FROM EUTRA-RRC-Definitions;

-- ASN1STOP

## 10.2.2 Message definitions

#### - HandoverCommand

This message is used to transfer the handover command generated by the target eNB.

Direction: target eNB to source eNB/ source RAN

#### HandoverCommand message

-- ASN1START

```
HandoverCommand ::=
                                     SEQUENCE {
                                    CHOICE {
    criticalExtensions
                                          CHOICE {
        c1
            handoverCommand-r8
                                                 HandoverCommand-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                             SEQUENCE { }
    }
}
HandoverCommand-r8-IEs ::=
handoverCommandMessage
                                    SEQUENCE {
                                        OCTET STRING (CONTAINING DL-DCCH-Message),
                                         SEQUENCE { }
                                                                             OPTIONAL
}
-- ASN1STOP
```

#### HandoverCommand field descriptions

#### handoverCommandMessage

Contains the entire DL-DCCH-Message including the *RRCConnectionReconfiguration* message used to perform handover within E-UTRAN or handover to E-UTRAN, generated (entirely) by the target eNB.

NOTE: The source BSC, in case of inter-RAT handover from GERAN to E-UTRAN, expects that the HandoverCommand message includes DL-DCCH-Message only. Thus, criticalExtensionsFuture, spare1-spare7 and nonCriticalExtension should not be used regardless whether the source RAT is E-UTRAN, UTRAN or GERAN.

#### HandoverPreparationInformation

This message is used to transfer the E-UTRA RRC information used by the target eNB or target ng-eNB during handover preparation, including UE capability information.

Direction: source eNB/ source RAN to target eNB or target ng-eNB

#### HandoverPreparationInformation message

```
-- ASN1START
HandoverPreparationInformation ::= SEQUENCE {
                          CHOICE {
   criticalExtensions
                                         CHOICE {
       c1
           handoverPreparationInformation-r8
                                             HandoverPreparationInformation-r8-IEs,
           spare7 NULL,
           spare6 NULL, spare5 NULL, spare4 NULL,
           spare3 NULL, spare2 NULL, spare1 NULL
       }.
       criticalExtensionsFuture
                                         SEOUENCE { }
   }
}
HandoverPreparationInformation-r8-IEs ::= SEQUENCE {
   ue-RadioAccessCapabilityInfo UE-CapabilityRAT-ContainerList,
                                      AS-Config OPTIONAL,
RRM-Config OPTIONAL,
   as-Config
                                                                                 -- Cond HO
   rrm-Config
                                      RRM-Config
                                                             OPTIONAL,
   as-Context
                                      AS-Context
                                                                             -- Cond HO
                                      HandoverPreparationInformation-v920-IEs
   nonCriticalExtension
                                                                                 OPTIONAL
}
HandoverPreparationInformation-v920-IEs ::= SEQUENCE {
                                      ENUMERATED {
   ue-ConfigRelease-r9
                                      rel9, rel10, rel11, rel12, v10j0, v11e0,
                                      v1280, rel13, ..., rel14, rel15}
                                                                         OPTIONAL, -- Cond
HO2
                                      HandoverPreparationInformation-v9d0-IEs
   nonCriticalExtension
                                                                                 OPTIONAL
}
HandoverPreparationInformation-v9d0-IEs ::= SEQUENCE {
```

lateNonCriticalExtension OCTET STRING (CONTAINING HandoverPreparationInformationv9j0-IEs) OPTIONAL, 0-IEs) OPTIONAL, nonCriticalExtension HandoverPreparationInformation-v9e0-IEs OPTIONAL } -- Late non-critical extensions: HandoverPreparationInformation-v9j0-IEs ::= SEQUENCE { -- Following field is only for pre REL-10 late non-critical extensions lateNonCriticalExtension OCTET STRING OPTIONAL, nonCriticalExtension HandoverPreparationInformation-v10j0-IEs OPTIONAL } HandoverPreparationInformation-v10j0-IEs ::= SEQUENCE { AS-Config-v10j0 OPTIONAL, as-Config-v10j0 as-conrig-v10j0 nonCriticalExtension HandoverPreparationInformation-v10x0-IEs OPTIONAL } HandoverPreparationInformation-v10x0-IEs ::= SEQUENCE { - Following field is only for late non-critical extensions from REL-10 to REL-12 lateNonCriticalExtension OCTET STRING OPTIONAL, HandoverPreparationInformation-v13c0-IEs nonCriticalExtension OPTIONAL } HandoverPreparationInformation-v13c0-IEs ::= SEQUENCE { AS-Config-v13c0 OPTIONAL, as-Config-v13c0 -- Following field is only for late non-critical extensions from REL-13 nonCriticalExtension SEQUENCE { } OPTIONAL } -- Regular non-critical extensions: HandoverPreparationInformation-v9e0-IEs ::= SEQUENCE { AS-Config-v9e0 as-Config-v9e0 OPTIONAL, -- Cond HO2 nonCriticalExtension HandoverPreparationInformation-v1130-IEs OPTIONAL } ::= SEQUENCE { HandoverPreparationInformation-v1130-IEs as-Context-v1130 AS-Context-v1130 nonCriticalExtension HandoverPreparati OPTIONAL, -- Cond HO2 HandoverPreparationInformation-v1250-IEs OPTTONAL. } HandoverPreparationInformation-v1250-IEs ::= SEQUENCE { ndoverPreparationInformation-v1250-IEs ::= SEQUENCE { ue-SupportedEARFCN-r12 ARFCN-ValueEUTRA-r9 OPTIONAL, -- C as-Config-v1250 AS-Config-v1250 OPTIONAL, -- Cond H02 nonCriticalExtension HandoverPreparationInformation-v1320-IEs OPTIONAL, -- Cond HO3 OPTIONAL } HandoverPreparationInformation-v1320-IEs ::= SEQUENCE { as-Config-v1320 AS-Config-v1320 as-Context-v1320 AS-Context-v1320 nonCriticalExtension HandoverPreparationInformatic OPTIONAL, -- Cond HO2 OPTIONAL, -- Cond HO2 HandoverPreparationInformation-v1430-IEs OPTIONAL } HandoverPreparationInformation-v1430-IEs ::= SEQUENCE { as-Config-v1430AS-Config-v1430OPTIONAL, -- CondmakeBeforeBreakReq-r14ENUMERATED {true}OPTIONAL, -- Cond HO2nonCriticalExtensionHandoverPreparationInformation-v1530-TESOPTIONAL OPTIONAL, -- Cond HO2 nonCriticalExtension HandoverPreparationInformation-v1530-IEs OPTTONAL } HandoverPreparationInformation-v1530-IEs ::= SEQUENCE { ran-NotificationAreaInfo-r15 RAN-NotificationAreaInfo-r15 C nonCriticalExtension HandoverPreparationInformation-v1540-IEs OPTIONAL, OPTIONAL } HandoverPreparationInformation-v1540-IEs ::= SEQUENCE { sourceRB-ConfigIntra5GC-r15 OCTET STRING OPTIONAL. --Cond HO4 nonCriticalExtension SEQUENCE { } OPTIONAL }

-- ASN1STOP

HandoverPreparationInformation field descriptions
<b>as-Config</b> The radio resource configuration. Applicable in case of intra-E-UTRA handover. If the target receives an incomplete <i>MeasConfig</i> and/or <i>RadioResourceConfigDedicated</i> in the <i>as-Config</i> , the target eNB may decide to apply the full configuration option based on the <i>ue-ConfigRelease</i> .
as-Context
Local E-UTRAN context required by the target eNB.
<i>makeBeforeBreakReq</i> To request the target eNB to add the <i>makeBeforeBreak</i> indication in the <i>mobilityControlInfo</i> in case of intra-frequency handover.
<i>rrm-Config</i> Local E-UTRAN context used depending on the target node's implementation, which is mainly used for the RRM purpose. May also be provided at inter-RAT intra-5GC handover from NR.
sourceRB-ConfigIntra5GC NR radio bearer config used at intra5GC handover, as defined by RadioBearerConfig IE in TS 38.331 [82].
<i>ue-ConfigRelease</i> Indicates the RRC protocol release or version applicable for the current UE configuration. This could be used by target eNB to decide if the full configuration approach should be used. If this field is not present, the target assumes that the current UE configuration is based on the release 8 version of RRC protocol. NOTE 1.
<b>ue-RadioAccessCapabilityInfo</b> For E-UTRA radio access capabilities, it is up to E-UTRA how the backward compatibility among supportedBandCombinationReduced, supportedBandCombination and supportedBandCombinationAdd is ensured. If supportedBandCombinationReduced and supportedBandCombination/supportedBandCombinationAdd are included into ueCapabilityRAT-Container, it can be assumed that the value of fields, requestedBands, reducedIntNonContCombRequested and requestedCCsXL are consistend with all supported band combination fields. NOTE 2
<i>ue-SupportedEARFCN</i> Includes UE supported EARFCN of the handover target E-UTRA cell if the target E-UTRA cell belongs to multiple frequency bands.

NOTE 1: The source typically sets the *ue-ConfigRelease* to the release corresponding with the current dedicated radio configuration. The source may however also consider the common radio resource configuration e.g. in case interoperability problems would appear if the UE temporary continues extensions of this part of the configuration in a target PCell not supporting them.

NOTE 2:	The following tal	ole indicates	per source RA	T whether RA	AT capabi	lities are in	cluded or	not.	

Source RAT	E-UTRA capabilites	UTRA capabilities	GERAN capabilities	MR DC capabilities	NR capabilities
UTRAN		May be included, ignored by eNB if received	May be included	Excluded	Excluded
GERAN CS		May be included, ignored by eNB if received	Included	Excluded	Excluded
GERAN PS		May be included, ignored by eNB if received	Included	Excluded	Excluded
E-UTRAN	Included	May be included	May be included	May be included	May be included
NR	Included	Excluded	Excluded	May be included	May be included

Conditional presence	Explanation
НО	The field is mandatory present in case of handover within E-UTRA; otherwise the field is
	not present.
HO2	The field is optional present in case of handover within E-UTRA; otherwise the field is not
	present.
НОЗ	The field is optional present in case of handover from GERAN to E-UTRA, otherwise the
	field is not present.
HO4	The field is mandatory present in case of handover within E-UTRA/5GC and optional
	present in case of handover from NR to E-UTRA/5GC; otherwise the field is not present.

SCG-Config

-

This message is used to transfer the SCG radio configuration generated by the SeNB.

Direction: Secondary eNB to master eNB

#### SCG-Config message

-- ASN1START criticalExtensions SCG-Config-r12 ::= SEQUENCE { CHOICE { c1 CHOICE { scg-Config-r12 SCG-Config-r12-IEs, spare7 NULL, spare6 NULL, spare5 NULL, spare4 NULL, spare3 NULL, spare2 NULL, spare1 NULL }, criticalExtensionsFuture SEQUENCE { } } } -Config-r12-IEs ::= SEQUENCE { scg-RadioConfig-r12 SCG-ConfigPartSCG-r12 OPTIONAL, nonCriticalExtension SCG-Config-v12i0a-IEs OPTIO SCG-Config-r12-IEs ::= OPTIONAL } SCG-Config-v12i0a-IEs ::= SEQUENCE { -- Following field is only for late non-critical extensions from REL-12 lateNonCriticalExtension OCTET STRING (CONTAINING SCG-Config-v12i0b-IEs) OPTIONAL, nonCriticalExtension SCG-Config-v13c0-IEs OPTIONAL } SCG-Config-v12i0b-IEs::=SEQUENCE {scg-RadioConfig-v12i0SCG-ConfignonCriticalExtensionSEQUENCE { SCG-ConfigPartSCG-v12f0 OPTIONAL, -- Need ON SEQUENCE { } OPTIONAL } -Config-v13c0-IEs ::= SEQUENCE { scg-RadioConfig-v13c0 SCG-ConfigPartSCG-v13c0 SCG-Config-v13c0-IEs ::= OPTIONAL, -- Following field is only for late non-critical extensions from REL-13 onwards nonCriticalExtension SEQUENCE { } OPTIONAL } -- ASN1STOP

SCG-Config field descriptions

scg-RadioConfig-r12

Includes the change of the dedicated SCG configuration and, upon addition of an SCG cell, the common SCG configuration.

The SeNB only includes a new SCG cell in response to a request from MeNB, but may include release of an SCG cell release or release of the SCG part of an SCG/Split DRB without prior request from MeNB. The SeNB does not use this field to initiate release of the SCG.

#### SCG-ConfigInfo

This message is used by MeNB to request the SeNB to perform certain actions e.g. to establish, modify or release an SCG, and it may include additional information e.g. to assist the SeNB with assigning the SCG configuration.

Direction: Master eNB to secondary eNB

#### SCG-ConfigInfo message

```
-- ASN1START

SCG-ConfigInfo-r12 ::= SEQUENCE {

criticalExtensions CHOICE {

cl CHOICE {

scg-ConfigInfo-r12 SCG-ConfigInfo-r12-IES,

spare7 NULL,

spare6 NULL, spare5 NULL, spare4 NULL,

spare3 NULL, spare2 NULL, spare1 NULL

},

criticalExtensionsFuture SEQUENCE {}
```

}

880

SCG-ConfigInfo-r12-IEs ::= SEQUENCE { radioResourceConiigueanse sCellToAddModListMCG-r12 SCellToAddModL Tarfig=r12 MeasGapConfig radioResourceConfigDedMCG-r12 RadioResourceConfigDedicated OPTIONAL, SCellToAddModList-r10 OPTIONAL, OPTIONAL. powerCoordinationInfo-r12 PowerCoordinationInfo-r12 scg-RadioConfig-r12 SCG-ConfigPartSCG-r12 OPTIONAL. OPTIONAL, eutra-CapabilityInfo-r12 eutra-CapabilityInfo-r12OCTET STRING (CONTAINING UECapabilityInformation)scg-ConfigRestrictInfo-r12SCG-ConfigRestrictInfo-r12OPTIONAL,mbmsInterestIndication-r12OCTET STRING (CONTAINING OPTIONAL, 
 MBMSInterestIndication-r11)
 OPTIONAL,

 measResultServCellListSCG-r12
 MeasResultServCellListSCG-r12
 OPTIONAL,
 drb-ToAddModListSCG-r12DRB-InfoListSCG-r12drb-ToReleaseListSCG-r12DRB-ToReleaseListsCellToAddModListSCG-r12SCellToAddModListSCG-r12 OPTIONAL, OPTIONAL, OPTIONAL, sCellToReleaseListSCG-r12 OPTIONAL, SCellToReleaseList-r10 P-Max p-Max-r12 OPTIONAL, SCG-ConfigInfo-v1310-IEs nonCriticalExtension OPTIONAL } SCG-ConfigInfo-v1310-IEs ::= SEQUENCE { sCellToAddModListMCG-Ext-r13 SCellToAddModList SCellToAddModListExt-r13 OPTIONAL, OPTIONAL, measResultServCellListSCG-Ext-r13 MeasResultServCellListSCG-Ext-r13 OPTIONAL, SCellToAddModListSCG-Ext-r13 0 llToReleaseListExt-r13 0PTIONAL, Configur6.ul220_IEg 0PTIONAL sCellToAddModListSCG-Ext-r13 OPTIONAL, sCellToReleaseListSCG-Ext-r13 SCellToReleaseListExt-r13 nonCriticalExtension SCG-ConfigInfo-v1330-IEs OPTIONAL } measResultListRSSI-SCG-r13 MeasResultListRSSI-SCG-r13 nonCriticalExtension SCG-ConfigInfo-v1430-IEs SCG-ConfigInfo-v1330-IEs ::= OPTIONAL, OPTIONAL } SCG-ConfigInfo-v1430-IEs ::= SEOUENCE { -Configinio-v1430-lEs ::= SEQUENCE { makeBeforeBreakSCG-Req-r14 ENUMERATED {true} OPTIONAL, measGapConfigPerCC-List MeasGapConfigPerCC-List-r14 OPTIONAL, SCG-ConfigInfo-v1530-IEs nonCriticalExtension OPTTONAL. } SCG-ConfigInfo-v1530-IEs ::= SEQUENCE { drb-ToAddModListSCG-r15 DRB-InfoListSCG-r15 drb-ToReleaseListSCG-r15 DRB-ToReleaseList-r15 nonCriticalExtension SEQUENCE {} OPTIONAL, OPTIONAL, SEQUENCE {} nonCriticalExtension OPTIONAL } SEQUENCE (SIZE (1..maxDRB)) OF DRB-InfoSCG-r12 SEQUENCE (SIZE (1..maxDRB-r15)) OF DRB-InfoSCG-r12 DRB-InfoListSCG-r12 ::= DRB-InfoListSCG-r15 ::= DRB-InfoSCG-r12 ::= SEQUENCE { eps-BearerIdentity-r12 INTEGER (0..15) OPTIONAL, -- Cond DRB-Setup drb-Identity-r12 DRB-Identity, drb-Type-r12 ENUMERATED {split, scg} OPTIONAL, -- Cond DRB-Setup . . . } SCellToAddModListSCG-r12 ::= SEQUENCE (SIZE (1..maxSCell-r10)) OF Cell-ToAddMod-r12 SCellToAddModListSCG-Ext-r13 ::= SEQUENCE (SIZE (1..maxSCell-r13)) OF Cell-ToAddMod-r12 Cell-ToAddMod-r12 ::= SEQUENCE { SCellIndex-r10, sCellIndex-r12 cellIdentification-r12 SEQUENCE { physCellId-r12 PhysCellId, dl-CarrierFreq-r12 ARFCN-ValueEUTRA-r9 OPTIONAL, -- Cond SCellAdd measResultCellToAdd-r12 SEQUENCE { RSRP-Range, rsrpResult-r12 rsrqResult-r12 RSRQ-Range } OPTIONAL, -- Cond SCellAdd2 . . , sCellIndex-r13 SCellIndex-r13 ]] OPTIONAL, measResultCellToAdd-v1310 SEQUENCE { rs-sinr-Result-r13 RS-SINR-Range-r13 } OPTIONAL -- Cond SCellAdd2 11

```
MeasResultServCellListSCG-r12 ::= SEQUENCE (SIZE (1..maxServCell-r10)) OF MeasResultServCellSCG-
r12
MeasResultServCellListSCG-Ext-r13 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF
MeasResultServCellSCG-r12
MeasResultServCellSCG-r12 ::= SEQUENCE {
servCellId-r12 ServCellIndex-r10,
measResultSCell-r12 SEQUENCE {
rsrpResultSCell-r12 RSRP-Range,
rsrqResultSCell-r12 RSRQ-Range
      },
      ...,
[[ servCellId-r13

    [[ servCellId-r13
    ServCellIndex-r13

    measResultSCell-v1310
    SEQUENCE {

    rs-sinr-ResultSCell-r13
    RS-SINR-Range-r13

                                                                  ServCellIndex-r13
                                                                                                     OPTIONAL,
            }
                                                                                                 OPTIONAL
     ]]
}
MeasResultListRSSI-SCG-r13 ::= SEQUENCE (SIZE (1..maxServCell-r13)) OF MeasResultRSSI-SCG-r13
MeasResultRSSI-SCG-r13 ::= SEQUENCE {
servCellId-r13 ServCe
measResultForRSSI-r13 MeasRes
                                                         ServCellIndex-r13,
                                                          MeasResultForRSSI-r13
}
SCG-ConfigRestrictInfo-r12 ::= SEQUENCE {
maxSCH-TB-BitsDL-r12 INTEGER (1..100),
maxSCH-TB-BitsUL-r12 INTEGER (1..100)
}
-- ASN1STOP
```

SCG-ConfigInfo field descriptions
drb-ToAddModListSCG
Includes DRBs the SeNB is requested to establish or modify (DRB type change).
drb-ToReleaseListSCG
Includes DRBs the SeNB is requested to release.
makeBeforeBreakSCG-Reg
To request the target eNB to add the makeBeforeBreakSCG indication in the mobilityControlInfoSCG in case of intra-
frequency SCG change.
maxSCH-TB-BitsXL
Indicates the maximum DL-SCH/UL-SCH TB bits that may be scheduled in a TTI. Specified as a percentage of the value
defined for the applicable UE category.
measGapConfig
Includes the current measurement gap configuration.
measResultListRSSI-SCG
Includes RSSI measurement results of SCG (serving) cells
measResultSSTD
Includes measurement results of UE SFN and Subframe Timing Difference between the PCell and the PSCell.
measResultServCellListSCG
Includes measurement results of SCG (serving) cells.
radioResourceConfigDedMCG
Includes the current dedicated MCG radio resource configuration.
sCellIndex
If sCellIndex-r13 is present, sCellIndex-r12 shall be ignored.
sCellToAddModListMCG, sCellToAddModListMCG-Ext
Includes the current MCG SCell configuration. Field sCellToAddModListMCG is used to add the first 4 SCells with
sCellIndex-r10 while sCellToAddModListMCG-Ext is used to add the rest.
sCellToAddModListSCG, sCellToAddModListSCG-Ext
Includes SCG cells the SeNB is requested to establish. Measurement results may be provided for these cells. Field
sCellToAddModListSCG is used to add the first 4 SCells with sCellIndex-r12 while sCellToAddModListSCG-Ext is used
to add the rest.
sCellToReleaseListSCG, sCellToReleaseListSCG-Ext
Includes SCG cells the SeNB is requested to release.
scg-RadioConfig
Includes the current dedicated SCG configuration.
scg-ConfigRestrictInfo
Includes fields for which MeNB explicitly indicates the restriction to be observed by SeNB.
servCellId
If servCellId-r13 is present, servCellId-r12 shall be ignored.
p-Max
Cell specific value i.e. as broadcast by PCell.

Conditional presence	Explanation	
DRB-Setup	The field is mandatory present in case DRB establishment is requested; otherwise the	
	field is not present.	
SCellAdd	The field is mandatory present in case SCG cell establishment is requested; otherwise	
	the field is not present.	
SCellAdd2	The field is optional present in case SCG cell establishment is requested; otherwise the	
	field is not present.	

_

## **UEPagingCoverageInformation**

This message is used to transfer UE paging coverage information, covering both upload to and download from the EPC.

Direction: eNB to/from EPC

#### UEPagingCoverageInformation message

ASN1START		
UEPagingCoverageInformat	tion ::= SEQUENCE {	
criticalExtensions	CHOICE {	
cl	CHOICE {	
uePagingCove spare7 NULL	erageInformation-r13	UEPagingCoverageInformation-r13-IEs,

```
spare6 NULL, spare5 NULL, spare4 NULL,
spare3 NULL, spare2 NULL, spare1 NULL
},
criticalExtensionsFuture SEQUENCE {}
}
UEPagingCoverageInformation-r13-IEs ::= SEQUENCE {
mpdcch-NumRepetition-r13 INTEGER (1..256) OPTIONAL,
nonCriticalExtension SEQUENCE {} OPTIONAL
}
```

```
-- ASN1STOP
```

#### UEPagingCoverageInformation field descriptions

*mpdcch-NumRepetition* Number of repetitions for MPDCCH. The value is an estimate of the required number of repetitions for MPDCCH for paging.

#### UERadioAccessCapabilityInformation

This message is used to transfer UE radio access capability information, covering both upload to and download from the EPC.

Direction: eNB to/ from EPC

#### UERadioAccessCapabilityInformation message

```
-- ASN1START
UERadioAccessCapabilityInformation ::= SEQUENCE {
    criticalExtensions
                                        CHOICE {
       c1
                                           CHOICE {
            ueRadioAccessCapabilityInformation-r8
                                                UERadioAccessCapabilityInformation-r8-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
                                           SEQUENCE { }
        criticalExtensionsFuture
    }
}
UERadioAccessCapabilityInformation-r8-IEs ::= SEQUENCE {
    ue-RadioAccessCapabilityInfo OCTET STRING (CONTAINING UECapabilityInformation),
    nonCriticalExtension
                                       SEQUENCE { }
                                                                            OPTIONAL
}
```

-- ASN1STOP

#### UERadioAccessCapabilityInformation field descriptions

ue-RadioAccessCapabilityInfo Including E-UTRA, GERAN, CDMA2000-1xRTT Bandclass, NR and MR-DC radio access capabilities (separated). UTRA radio access capabilities are not included. For E-UTRA radio access capabilities, it is up to E-UTRA how the compatibility among supportedBandCombinationReduced, supportedBandCombination backward and supportedBandCombinationReduced supportedBandCombinationAdd is lf and ensured. supportedBandCombination/supportedBandCombinationAdd are included into ueCapabilityRAT-Container, it can be assumed that the value of fields, requestedBands, reducedIntNonContCombRequested and requestedCCsXL are consistent with all supported band combination fields.

#### **UERadioPagingInformation**

This message is used to transfer radio paging information, covering both upload to and download from the EPC/5GC.

Direction: eNB to/ from EPC/5GC

```
UERadioPagingInformation message
```

```
-- ASN1START
UERadioPagingInformation ::= SEQUENCE {
    criticalExtensions
                                        CHOICE {
       c1
                                           CHOICE {
            ueRadioPagingInformation-r12
                                                   UERadioPagingInformation-r12-IEs,
            spare7 NULL,
            spare6 NULL, spare5 NULL, spare4 NULL,
            spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                           SEQUENCE { }
    }
}
UERadioPagingInformation-r12-IEs ::= SEQUENCE {
    ue-RadioPagingInfo-r12 OCTET STRING (CONTAINING UE-RadioPagingInfo-r12),
    nonCriticalExtension
                                       UERadioPagingInformation-v1310-IEs
                                                                                    OPTIONAL
}
UERadioPagingInformation-v1310-IEs ::= SEQUENCE {
   supportedBandListEUTRAForPaging-r13 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicator-r11
OPTIONAL.
                                           SEQUENCE { }
    nonCriticalExtension
                                                                                    OPTIONAL
}
```

-- ASN1STOP

UERadioPagingInformation field descriptions

*ue-RadioPagingInfo* The field is used to transfer UE capability information used for paging. The eNB generates the *ue-RadioPagingInfo* and the contained UE capability information is absent when not supported by the UE. *supportedBandListEUTRAForPaging* Indicates the UE supported frequency bands which is derived by the eNB from *UE-EUTRA-Capability*.

# 10.3 Inter-node RRC information element definitions

#### AS-Config

The *AS-Config* IE contains information about RRC configuration information in the source eNB which can be utilized by target eNB to determine the need to change the RRC configuration during the handover preparation phase. The information can also be used after the handover is successfully performed or during the RRC connection re-establishment or resume.

#### AS-Config information element

	ASN1START		
AS-	Config ::= SEQUENCE {		
	sourceMeasConfig	MeasConfig,	
	sourceRadioResourceConfig	RadioResourceConfigDedicated,	
	sourceSecurityAlgorithmConfig	SecurityAlgorithmConfig,	
	sourceUE-Identity	C-RNTI,	
	sourceMasterInformationBlock	MasterInformationBlock,	
	sourceSystemInformationBlockTypel	<pre>SystemInformationBlockTypel(WITH COMPONENTS {, nonCriticalExtension ABSENT}),</pre>	
	sourceSystemInformationBlockType2	SystemInformationBlockType2,	
	antennaInfoCommon	AntennaInfoCommon,	
	sourceDl-CarrierFreq	ARFCN-ValueEUTRA,	
	, [[ sourceSystemInformationBlockType	elExt OCTET STRING (CONTAINING SystemInformationBlockType1-v890-IEs)	OPTIONAL,
	sourceOtherConfig-r9	OtherConfig-r9	
	-	been optional. A target eNB compliant with this an AS-Config not including this extension additi	

-- e.g. from a legacy source eNB ]], [[ sourceSCellConfigList-r10 SCellToAddModList-r10 OPTIONAL ]], [[ sourceConfigSCG-r12 SCG-Config-r12 OPTIONAL ]], [[ as-ConfigNR-r15 AS-ConfigNR-r15 OPTIONAL ]], [[ as-Config-v1550 AS-Config-v1550 OPTIONAL ]], [[ as-ConfigNR-v1570 AS-ConfigNR-v1570 OPTIONAL 11 } Config-v9e0 ::= SEQUENCE { sourceDl-CarrierFreq-v9e0 ARFCN-ValueEUTRA-v9e0 AS-Config-v9e0 ::= } AS-Config-v10j0 ::= SEQUENCE { antennaInfoDedicatedPCell-v10i0 AntennaInfoDedicated-v10i0 OPTIONAL } SEQUENCE { AS-Config-v1250 ::= OPTIONAL, sourceSL-DiscConfig-r12 SL-DiscConfig-r12 sourceSL-CommConfig-r12 SL-CommConfig-r12 OPTIONAL } Config-v1320 ::=SEQUENCE {sourceSCellConfigList-r13SCellToAddModListExt-r13OPTIONAL,sourceRCLWI-Configuration-r13RCLWI-Configuration-r13OPTIONAL AS-Config-v1320 ::= } AS-Config-v13c0 ::= SEQUENCE { radioResourceConfigDedicated-v13c01 RadioResourceConfigDedicated-v1370 OPTIONAL, radioResourceConfigDedicated-v13c02 RadioResourceConfigDedicated-v13c0 OPTIONAL, sCellToAddModList-v13c0SCellToAddModList-v13c0OPTIONALsCellToAddModListExt-v13c0SCellToAddModListExt-v13c0OPTIONAL } AS-Config-v1430 ::= SEQUENCE { sourceSL-V2X-CommConfig-r14 SL-V2X-ConfigDedicated-r14 OPTIONAL. sourceLWA-Config-r14 LWA-Config-r13 sourceWLAN-MeasResult-r14 MeasResultListWLAN-r13 OPTIONAL, OPTIONAL } sourceRB-ConfigNR-r15 SEQUENCE { AS-ConfigNR-r15 ::= 
 ConfigNR-r15 ::=
 SEQUENCE {

 sourceRB-ConfigNR-r15
 OCTET STRING

 sourceRB-ConfigSN-NR-r15
 OCTET STRING

 sourceOtherConfigSN-NR-r15
 OCTET STRING
 OPTIONAL, } AS-ConfigNR-v1570 ::= ConfigNR-v1570 ::= SEQUENCE { sourceSCG-ConfiguredNR-r15 ENUMERATED {true} } AS-Config-v1550 ::= Config-v1550 ::= SEQUENCE { tdm-PatternConfig-r15 SEQUENCE { subframeAssignment-r15 SubframeAssignment-r15, harq-Offset-r15 INTEGER (0.. 9) OPTIONAL, P-Max p-MaxEUTRA-r15 OPTIONAL } -- ASN1STOP

NOTE: The *AS-Config* re-uses information elements primarily created to cover the radio interface signalling requirements. Consequently, the information elements may include some parameters that are not relevant for the target eNB e.g. the SFN as included in the *MasterInformationBlock*.

AS-Config field descriptions	
tennalnfoCommon	
is field provides information about the number of antenna ports in the source PCell.	
MaxEUTRA	
licates the <i>p-MaxEUTRA</i> in the source PCell.	
urceOtherConfigSN-NR	
her NR config set by SN (cell group, measurements) in case of (NG)EN-DC i.e. as defined by the	
RCReconfiguration message in TS 38.331 [82].	
urceRB-ConfigNR	
R radio bearer config, as defined by <i>RadioBearerConfig</i> IE in TS 38.331 [82]. The field may e.g. be set by M	N in
se of (NG)EN-DC, by source eNB connected to 5GCN.	• • • •
urceRB-ConfigSN-NR	
R radio bearer config set by SN in case of (NG)EN-DC or of SN terminated RB without SCG, as defined by	
idioBearerConfig IE in TS 38.331 [82].	
urceDL-CarrierFreq	
by the parameter Downlink EARFCN in the source PCell, see TS 36.101 [42]. If the source eNB provide	ο Δ <u>ς</u>
onfig-v9e0, it sets sourceDI-CarrierFreq (i.e. without suffix) to maxEARFCN.	-07 6
urceLWA-Config	
A configuration in the source PCell when handover is triggered.	
urceOtherConfig	
ovides other configuration in the source PCell. urceMasterInformationBlock	
asterInformationBlock transmitted in the source PCell.	
urceMeasConfig	
asurement configuration in the source cell. The measurement configuration for all measurements existing in	n the
urce eNB when handover is triggered shall be included. See 10.5.	
urceRCLWI-Configuration	
CLWI Configuration in the source PCell.	
urceSL-CommConfig	
is field covers the sidelink communication configuration.	
urceSL-DiscConfig	
is field covers the sidelink discovery configuration.	
urceRadioResourceConfig	
dio configuration in the source PCell. The radio resource configuration for all radio bearers existing in the so	ource
Cell when handover is triggered shall be included. See 10.5.	
urceSCellConfigList	
dio resource configuration (common and dedicated) of the SCells configured in the source eNB.	
urceSCG-ConfiguredNR	
lue true indicates that the UE is configured with NR SCG in source configuration. The field is included only i	f
urceOtherConfigSN-NR is not included.	
urceSecurityAlgorithmConfig	
is field provides the AS integrity protection (SRBs) and AS ciphering (SRBs and DRBs) algorithm configurat	tion
ed in the source PCell.	
urceSystemInformationBlockType1	
stemInformationBlockType1 (or SystemInformationBlockType1-BR) transmitted in the source PCell.	
urceSystemInformationBlockType2	
stemInformationBlockType2 transmitted in the source PCell.	
urceSL-V2X-CommConfig	
licates the V2X sidelink communication related configurations configured in the source eNB.	
urceWLAN-MeasResult	
AN measurement results in the source PCell when handover is triggered.	
-AN measurement results in the source r Ceir when handover is thggered.	
licates the TDM pattern configuration in the source PCell.	

## AS-Context

The IE AS-Context is used to transfer local E-UTRAN context required by the target eNB.

#### AS-Context information element

 ASN1START	

AS-Context	::=
reestak	olishmentInfo
}	

SEQUENCE { ReestablishmentInfo

AS-Context-v1130 ::=	SEQUENCE {	
idc-Indication-r11	OCTET STRING (CONTAINING	
	InDeviceCoexIndication-r11) OPT	IONAL, Cond HO2
mbmsInterestIndication-r11	OCTET STRING (CONTAINING	
	MBMSInterestIndication-r11) OPT:	IONAL, Cond HO2
powerPrefIndication-r11	OCTET STRING (CONTAINING	
	UEAssistanceInformation-r11)	OPTIONAL, Cond HO2
, [[ sidelinkUEInformation-r12	OCTET STRING (CONTAINING	
	SidelinkUEInformation-r12)	OPTIONAL Cond HO2
11,		011101012 00110 1102
[[ sourceContextEN-DC-r15	OCTET STRING	OPTIONAL Cond HO2
]],		
[[ selectedbandCombinationInfoEN-D	C-v1540 OCTET STRING	OPTIONAL Cond HO2
]]		
}		
AS-Context-v1320 ::=	SEQUENCE {	
wlanConnectionStatusReport-r13	OCTET STRING (CONTAINING	OPTIONAL Cond HO2
3	WLANConnectionStatusReport-r13)	OFITOMAL COND HOZ
J		

-- ASN1STOP

AS-Context field descriptions		
idc-Indication		
Including information used for handling the IDC problems.		
reestablishmentInfo		
Including information needed for the RRC connection re-establishment.		
sourceContextEN-DC		
(NG)EN-DC related context information, in particular regarding the UE capability coordination, as defined by the SCG-		
ConfigRestrictInfoSCG IE specified in TS 38.331 [82].		
selectedBandCombinationInfoEN-DC		
Including the BandCombinationInfoSN IE specified in TS 38.331 [82]. See NOTE 1.		

Conditional presence	Explanation	
НО	The field is mandatory present in case of handover within E-UTRA; otherwise the field is not present.	
HO2	The field is optional present in case of handover within E-UTRA; otherwise the field is no present.	

NOTE 1: If the field is present, it is used to help target MN to decide appropriate LTE band for SCell frequency measurement in case of inter-MN handover without SN change.

#### ReestablishmentInfo

The ReestablishmentInfo IE contains information needed for the RRC connection re-establishment.

#### ReestablishmentInfo information element

```
-- ASN1START
                        oList
ReestablishmentInfo ::=
                                  SEQUENCE {
                                  PhysCellId,
   sourcePhysCellId
   targetCellShortMAC-I
                                      ShortMAC-I,
   additionalReestabInfoList
                                      AdditionalReestabInfoList
                                                                              OPTIONAL,
    . . .
}
AdditionalReestabInfoList ::=
                                   SEQUENCE ( SIZE (1..maxReestabInfo) ) OF AdditionalReestabInfo
AdditionalReestabInfo ::= SEQUENCE{
                                       CellIdentity,
   cellIdentity
   key-eNodeB-Star
                                       Key-eNodeB-Star,
   shortMAC-I
                                       ShortMAC-I
}
                                   BIT STRING (SIZE (256))
Key-eNodeB-Star ::=
```

-- ASN1STOP

#### ReestablishmentInfo field descriptions

additionalReestabInfoList
Contains a list of shortMAC-I and KeNB* for cells under control of the target eNB, required for potential reestablishment by the UE in these cells to succeed.
Key-eNodeB-Star
Parameter KeNB*: See TS 33.401 [32], clause 7.2.8.4. If the cell identified by cellIdentity belongs to multiple frequency bands, the source eNB selects the DL-EARFCN for the KeNB* calculation using the same logic as UE uses when selecting the DL-EARFCN in IDLE as defined in clause 6.2.2. This parameter is only used for X2 handover, and for S1 handover, it shall be ignored by target eNB.
sourcePhyCellId

The physical cell identity of the source PCell, used to determine the UE context in the target eNB at re-establishment. *targetCellShortMAC-I* 

The ShortMAC-I for the handover target PCell, in order for potential re-establishment to succeed.

RRM-Config

The *RRM-Config* IE contains information about UE specific RRM information before the handover which can be utilized by target eNB.

#### **RRM-Config** information element

```
-- ASN1START
RRM-Config ::=
                             SEQUENCE {
                                 ENUMERATED {
    ue-InactiveTime
                                     s1, s2, s3, s5, s7, s10, s15, s20,
                                     s25, s30, s40, s50, min1, min1s20c, min1s40,
                                     min2, min2s30, min3, min3s30, min4, min5, min6,
                                     min7, min8, min9, min10, min12, min14, min17, min20,
                                      min24, min28, min33, min38, min44, min50, hr1,
                                      hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,
                                     hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,
day2hr12, day3, day4, day5, day7, day10, day14, day19,
                                     day24, day30, dayMoreThan30}
                                                                           OPTIONAL,
    [[ candidateCellInfoList-r10 CandidateCellInfoList-r10
                                                                       OPTIONAL
    11,
    [[
        candidateCellInfoListNR-r15 MeasResultServFreqListNR-r15
                                                                           OPTIONAL
    ]]
}
                                SEQUENCE (SIZE (1..maxFreq)) OF CandidateCellInfo-r10
CandidateCellInfoList-r10 ::=
CandidateCellInfo-r10 ::=
                                 SEQUENCE {
    -- cellIdentification
    physCellId-r10
                                     PhysCellId,
    dl-CarrierFreq-r10
                                     ARFCN-ValueEUTRA,
    -- available measurement results
    rsrpResult-r10
                                     RSRP-Range
                                                          OPTIONAL,
    rsrqResult-r10
                                     RSRO-Range
                                                          OPTIONAL.
    [[ dl-CarrierFreq-v1090
                                         ARFCN-ValueEUTRA-v9e0
                                                                       OPTIONAL
    ]],
    [[ rsrqResult-v1250
                                         RSRO-Range-v1250
                                                                       OPTIONAL
    1],
        rs-sinr-Result-r13
                                         RS-SINR-Range-r13
                                                                       OPTIONAL
    [[
    ]]
}
-- ASN1STOP
```

#### **RRM-Config** field descriptions

#### candidateCellInfoList

A list of the best cells on each frequency for which measurement information was available, in order of decreasing RSRP.

#### candidateCellInfoListNR

A list of NR cells including serving cells and best neighbour cells on each SSB requency, for which measurement results were available, and for each cell the best beams.

#### dl-CarrierFreq

The source includes *dl-CarrierFreq-v1090* if and only if *dl-CarrierFreq-r10* is set to *maxEARFCN*.

#### ue-InactiveTime

Duration while UE has not received or transmitted any user data. Thus the timer is still running in case e.g., UE measures the neighbour cells for the HO purpose. Value s1 corresponds to 1 second, s2 corresponds to 2 seconds and so on. Value min1 corresponds to 1 minute, value min1s20 corresponds to 1 minute and 20 seconds, value min1s40 corresponds to 1 minute and 40 seconds and so on. Value hr1 corresponds to 1 hour, hr1min30 corresponds to 1 hour and 30 minutes and so on.

# 10.4 Inter-node RRC multiplicity and type constraint values

<ul> <li>Multiplicity a</li> </ul>	and type con	straints definitions
ASN1START		
maxReestabInfo	INTEGER ::= 32	Maximum number of KeNB* and shortMAC-I forwarded at handover for re-establishment preparation
ASN1STOP		

## End of EUTRA-InterNodeDefinitions

-- ASN1START END

-- ASN1STOP

# 10.5 Mandatory information in *AS-Config*

The *AS-Config* transferred between source eNB and target-eNB shall include all IEs necessary to describe the AS context. The conditional presence in clause 6 is only applicable for eNB to UE communication.

The "need" or "cond" statements are not applied in case of sending the IEs from source eNB to target eNB. Some fields shall be included regardless of the "need" or "cond" e.g. *discardTimer*. The *AS-Config* re-uses information elements primarily created to cover the radio interface signalling requirements. The information elements may include some parameters that are not relevant for the target eNB e.g. the SFN as included in the *MasterInformationBlock*.

All the fields in the *AS-Config* as defined in 10.3 that are introduced after v9.2.0 and that are optional for eNB to UE communication shall be included, if the functionality is configured, except for the fields *sourceOtherConfigSN-NR* and *sourceRB-ConfigSN-NR* in AS-*ConfigNR*. The fields in the *AS-Config* that are defined before and including v9.2.0 shall be included as specified in the following.

Within the *sourceRadioResourceConfig, sourceMeasConfig* and *sourceOtherConfig*, the source eNB shall include fields that are optional for eNB to UE communication, if the functionality is configured unless explicitly specified otherwise in the following:

- in accordance with a condition that is explicitly stated to be applicable; or
- a default value is defined for the concerned field; and the configured value is the same as the default value that is defined; or

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- the need of the field is OP and the current UE configuration corresponds with the behaviour defined for absence of the field;

The following fields, if the functionality is configured, are not mandatory for the source eNB to include in the *AS*-*Config* since delta signalling by the target eNB for these fields is not supported:

- semiPersistSchedC-RNTI
- measGapConfig

For the measurement configuration, a corresponding operation as 5.5.6.1 and 5.5.2.2a is executed by target eNB.

# 10.6 Inter-node NB-IoT messages

## 10.6.1 General

This clause specifies NB-IoT RRC messages that are sent either across the X2- or the S1-interface, either to or from the eNB, i.e. a single 'logical channel' is used for all NB-IoT RRC messages transferred across network nodes.

## – NB-IoT-InterNodeDefinitions

This ASN.1 segment is the start of the NB-IoT inter-node PDU definitions.

```
-- ASN1START
NBIOT-InterNodeDefinitions DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
IMPORTS
    C-RNTI,
    PhysCellId.
    SecurityAlgorithmConfig,
    ShortMAC-I
FROM EUTRA-RRC-Definitions
   AdditionalReestabInfoList
FROM EUTRA-InterNodeDefinitions
    CarrierFreq-NB-r13,
    CarrierFreq-NB-v1550,
    RadioResourceConfigDedicated-NB-r13,
    UECapabilityInformation-NB,
    UE-Capability-NB-r13,
    UE-Capability-NB-Ext-r14-IEs,
    UE-RadioPagingInfo-NB-r13
FROM NBIOT-RRC-Definitions;
```

-- ASN1STOP

# 10.6.2 Message definitions

#### HandoverPreparationInformation-NB

This message is used to transfer the UE context from the eNB where the RRC connection has been suspended and transfer it to the eNB where the RRC Connection has been requested to be resumed.

Direction: source eNB to target eNB

#### HandoverPreparationInformation-NB message

```
-- ASN1START
HandoverPreparationInformation-NB ::= SEQUENCE {
criticalExtensions CHOICE {
cl CHOICE {
```

```
handoverPreparationInformation-r13
                                                 HandoverPreparationInformation-NB-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
        }.
                                           SEQUENCE { }
        criticalExtensionsFuture
    }
}
HandoverPreparationInformation-NB-IEs ::= SEQUENCE {
                                        UE-Capability-NB-r13,
   ue-RadioAccessCapabilityInfo-r13
   as-Config-r13
                                           AS-Config-NB,
   rrm-Config-r13
                                          RRM-Config-NB
                                                                          OPTIONAL,
                                                                          OPTIONAL,
   as-Context-r13
                                          AS-Context-NB
   nonCriticalExtension
                                           HandoverPreparationInformation-NB-v1380-IEs
   OPTIONAL
}
HandoverPreparationInformation-NB-v1380-IEs ::= SEQUENCE {
    lateNonCriticalExtension OCTET STRING
                                                                          OPTIONAL,
   nonCriticalExtension
                                      HandoverPreparationInformation-NB-Ext-r14-IEs
                                                                                      OPTIONAL
}
HandoverPreparationInformation-NB-Ext-r14-IEs ::= SEQUENCE {
   ue-RadioAccessCapabilityInfoExt-r14 OCTET STRING (CONTAINING UE-Capability-NB-Ext-r14-IEs)
   OPTIONAL,
   nonCriticalExtension
                                           SEQUENCE { }
                                                                          OPTTONAL.
}
```

```
-- ASN1STOP
```

HandoverPreparationInformation-NB field descriptions		
as-Config		
The radio resource configuration.		
as-Context		
The local E-UTRAN context required by the target eNB.		
rrm-Config		
The local E-UTRAN context used depending on the target node's implementation, which is mainly used for the RRM		
purpose.		
ue-RadioAccessCapabilityInfo, ue-RadioAccessCapabilityInfoExt		
The NB-IoT UE Radio Access Capability Parameters, see TS 36.306 [5].		

## UEPagingCoverageInformation-NB

This message is used to transfer UE paging coverage information for NB-IoT, covering both upload to and download from the EPC.

Direction: eNB to/from EPC

```
UEPagingCoverageInformation-NB message
```

```
-- ASN1START
UEPagingCoverageInformation-NB ::= SEQUENCE {
                       CHOICE {
   criticalExtensions
                                         CHOICE {
       c1
           uePagingCoverageInformation-r13
                                                 UEPagingCoverageInformation-NB-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
       },
       criticalExtensionsFuture
                                         SEQUENCE { }
   }
}
UEPagingCoverageInformation-NB-IEs ::= SEQUENCE {
-- the possible value(s) can differ from those sent on Uu
   npdcch-NumRepetitionPaging-r13
                                         INTEGER (1..2048) OPTIONAL,
   nonCriticalExtension
                                         SEQUENCE { }
                                                        OPTIONAL
}
-- ASN1STOP
```

#### UEPagingCoverageInformation-NB field descriptions

npdcch-NumRepetitionPaging

Number of repetitions for NPDCCH, see TS 36.211 [21]. This value is an estimate of the required number of repetitions for NPDCCH.

#### UERadioAccessCapabilityInformation-NB

This message is used to transfer UE NB-IoT Radio Access capability information, covering both upload to and download from the EPC.

Direction: eNB to/ from EPC

#### UERadioAccessCapabilityInformation-NB message

```
-- ASN1START
UERadioAccessCapabilityInformation-NB ::= SEQUENCE
    criticalExtensions
                                           CHOICE
                                              CHOICE {
       c1
           ueRadioAccessCapabilityInformation-r13
                                                   UERadioAccessCapabilityInformation-NB-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                               SEQUENCE { }
    }
}
UERadioAccessCapabilityInformation-NB-IEs ::= SEQUENCE {
   ue-RadioAccessCapabilityInfo-r13
                                               OCTET STRING (CONTAINING UE-Capability-NB-r13),
    nonCriticalExtension
                                               UERadioAccessCapabilityInformation-NB-v1380-IEs
    OPTIONAL
}
UERadioAccessCapabilityInformation-NB-v1380-IEs ::= SEQUENCE {
   lateNonCriticalExtension OCTET STRING
                                                                          OPTIONAL.
    nonCriticalExtension
                                           UERadioAccessCapabilityInformation-NB-r14-IEs
    OPTIONAL
}
UERadioAccessCapabilityInformation-NB-r14-IEs ::= SEQUENCE {
   ue-RadioAccessCapabilityInfo-r14 OCTET STRING (CONTAINING UECapabilityInformation-NB)
    OPTIONAL,
                                           SEQUENCE { }
                                                                          OPTIONAL
   nonCriticalExtension
}
-- ASN1STOP
```

UERadioAccessCapabilityInformation-NB field descriptions ue-RadioAccessCapabilityInfo The NB-IoT UE Radio Access Capability Parameters, see TS 36.306 [5].

#### UERadioPagingInformation-NB

This message is used to transfer NB-IoT radio paging information, covering both upload to and download from the EPC.

Direction: eNB to/ from EPC

#### UERadioPagingInformation-NB message

```
-- ASN1START
UERadioPagingInformation-NB ::= SEQUENCE {
criticalExtensions CHOICE {
cl CHOICE {
ueRadioPagingInformation-r13 UERadioPagingInformation-NB-IES,
spare3 NULL, spare2 NULL, spare1 NULL
},
```

}	<pre>criticalExtensionsFuture }</pre>	SEQUENCE {]	}	
UE }	RadioPagingInformation-NB-IEs ::= SEQU ue-RadioPagingInfo-r13 nonCriticalExtension	<b>`</b>	CONTAINING UE-RadioPagingInfo-	NB-r13), OPTIONAL
	ASN1STOP			

#### UERadioPagingInformation-NB field descriptions

*ue-RadioPagingInfo* The field is used to transfer UE NB-IoT capability information used for paging. The eNB generates the *ue-RadioPagingInfo* and the contained UE capability information is absent when not supported by the UE.

# 10.7 Inter-node NB-IoT RRC information element definitions

#### – AS-Config-NB

The AS-Config-NB IE contains information about NB-IoT RRC configuration information in the source eNB which can be utilized by target eNB.

#### AS-Config-NB information element

```
-- ASN1START

AS-Config-NB ::= SEQUENCE {

sourceRadioResourceConfig-r13 RadioResourceConfigDedicated-NB-r13,

sourceSecurityAlgorithmConfig-r13 SecurityAlgorithmConfig,

sourceUE-Identity-r13 C-RNTI,

sourceD1-CarrierFreq-r13 CarrierFreq-NB-r13,

...,

[[ sourceDL-CarrierFreq-v1550 CarrierFreq-NB-v1550 OPTIONAL -- Cond TDD

]]

}
```

```
-- ASN1STOP
```

AS-Config-NB field descriptions			
sourceDL-CarrierFreq			
Provides the parameter Downlink EARFCN in the source PCell, see TS 36.101 [42].			
sourceRadioResourceConfig			
Radio configuration in the source PCell. The radio resource configuration for all radio bearers existing in the source			
PCell shall be included. See 10.9.			
sourceSecurityAlgorithmConfig			
This field provides the AS integrity protection (SRBs) and AS ciphering (SRBs and DRBs) algorithm configuration used			
in the source PCell.			

Conditional presence	Explanation	
TDD	The field is optionally present in case of TDD; otherwise the field is not present.	

### – AS-Context-NB

The IE AS-Context-NB is used to transfer the UE context required by the target eNB.

#### AS-Context-NB information element

ASN1START			
AS-Context-NB ::= reestablishmentInfo-r13	SEQUENCE { ReestablishmentInfo-NB	OPTIONAL,	

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} ...

-- ASN1STOP

#### AS-Context-NB field descriptions

*reestablishmentInfo* Including information needed for the RRC connection re-establishment.

#### ReestablishmentInfo-NB

The ReestablishmentInfo-NB IE contains information needed for the RRC connection re-establishment.

#### ReestablishmentInfo-NB information element

ASN1START		
<pre>ReestablishmentInfo-NB ::=    sourcePhysCellId-r13    targetCellShortMAC-I-r13    additionalReestabInfoList-r13  }</pre>	SEQUENCE { PhysCellId, ShortMAC-I, AdditionalReestabInfoList	OPTIONAL,
ASN1STOP		

 
 ReestablishmentInfo-NB field descriptions

 additionalReestabInfoList

 Contains a list of shortMAC-I and KeNB* for cells under control of the target eNB, required for potential reestablishment by the UE in these cells to succeed.

 sourcePhyCellId

 The physical cell identity of the source PCell, used to determine the UE context in the target eNB at re-establishment.

 targetCellShortMAC-I

 The ShortMAC-I for the target PCell, in order for potential re-establishment to succeed.

#### RRM-Config-NB

The RRM-Config-NB IE contains information about UE specific RRM information which can be utilized by target eNB.

#### **RRM-Config-NB** information element

ASN1START	
RRM-Config-NB ::= ue-InactiveTime	<pre>SEQUENCE { ENUMERATED {     sl, s2, s3, s5, s7, s10, s15, s20,     s25, s30, s40, s50, min1, min1s20, min1s40,     min2, min2s30, min3, min3s30, min4, min5, min6,     min7, min8, min9, min10, min12, min14, min17, min20,     min24, min28, min33, min38, min44, min50, hr1,     hr1min30, hr2, hr2min30, hr3, hr3min30, hr4, hr5, hr6,     hr8, hr10, hr13, hr16, hr20, day1, day1hr12, day2,     day2hr12, day3, day4, day5, day7, day10, day14, day19,     day24, day30, dayMoreThan30 }     OPTIONAL,</pre>
}	
ASN1STOP	

	RRM-Config-NB field descriptions			
Duration to 2 seco seconds	<b>tiveTime</b> while UE has not received or transmitted any user data. Value s1 corresponds to 1 second, s2 corresponds onds and so on. Value min1 corresponds to 1 minute, value min1s20 corresponds to 1 minute and 20 , value min1s40 corresponds to 1 minute and 40 seconds and so on. Value hr1 corresponds to 1 hour, 0 corresponds to 1 hour and 30 minutes and so on.			
10.8	Inter-node RRC multiplicity and type constraint values			
-	Multiplicity and type constraints definitions			
_	End of NB-IoT-InterNodeDefinitions			
ASN1ST				
END				
ASN1ST	)P			

# 10.9 Mandatory information in AS-Config-NB

The *AS-Config-NB* transferred between source eNB and target-eNB shall include all IEs necessary to describe the AS context. The conditional presence in clause 6 is only applicable for eNB to UE communication.

The "Need" or "Cond" statements are not applied in case of sending the IEs from source eNB to target eNB. Some information elements shall be included regardless of the "Need" or "Cond" e.g. *discardTimer*. The *AS-Config-NB* reuses information elements primarily created to cover the radio interface signalling requirements.

Within the *sourceRadioResourceConfig*, the source eNB shall include fields that are optional for eNB to UE communication, if the functionality is configured unless explicitly specified otherwise in the following:

- in accordance with a condition that is explicitly stated to be applicable; or
- a default value is defined for the concerned field; and the configured value is the same as the default value that is defined; or
- the need of the field is OP and the current UE configuration corresponds with the behaviour defined for absence of the field;

# 11 UE capability related constraints and performance requirements

# 11.1 UE capability related constraints

The following table lists constraints regarding the UE capabilities that E-UTRAN is assumed to take into account.

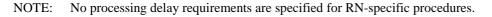
Parameter	Description	Value	NB-IoT
#DRBs	The number of DRBs that a UE shall support	8, 15	(0, 1, 2)
			NOTE1

Parameter	Description	Value	NB-IoT	
#RLC-AM	The number of RLC AM entities that a UE shall support	10, 17	(2, 3)	
			NOTE1	
#minCellperMeasObjec tEUTRA	MeasObjec The minimum number of neighbour cells (excluding black list cells) that a UE shall be able to store within a MeasObjectEUTRA. NOTE.			
#minBlackCellRangesp erMeasObjectEUTRA	The minimum number of blacklist cell PCI ranges that a UE shall be able to store within a MeasObjectEUTRA	32	N/A	
#minCellperMeasObjec tUTRA	The minimum number of neighbour cells that a UE shall be able to store within a MeasObjectUTRA. NOTE.	32	N/A	
#minCellperMeasObjec tGERAN	The minimum number of neighbour cells that a UE shall be able to store within a measObjectGERAN. NOTE.	32	N/A	
#minCellperMeasObjecThe minimum number of neighbour cells that a UE shall able to store within a measObjectCDMA2000. NOTE.		32	N/A	
#minCellTotal	The minimum number of neighbour cells (excluding black list cells) that UE shall be able to store in total in all measurement objects configured	256	N/A	
which the UE is most (# minCel respectively.	reporting, the limit regarding the cells E-UTRAN can configure incles requested to report CGI i.e. the amount of neighbour cells that can liperMeasObjectRAT - 1), where RAT represents EUTRA/UTRA/G on UE capability, #RLC-AM =#DRBs + 2.	an be includ	ed is at	

# 11.2 Processing delay requirements for RRC procedures

The UE performance requirements for RRC procedures are specified in the following tables, by means of a value N:

N = the number of 1ms subframes from the end of reception of the E-UTRAN -> UE message on the UE physical layer up to when the UE shall be ready for the reception of uplink grant for the UE -> E-UTRAN response message with no access delay other than the TTI-alignment (e.g. excluding delays caused by scheduling, the random access procedure or physical layer synchronisation).



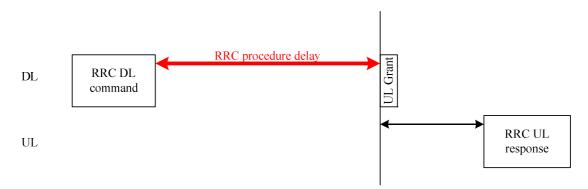


Figure 11.2-1: Illustration of RRC procedure delay

Table 11.2-1: UE performance requirements for RRC procedures for UEs other than NB-IoT UEs

Procedure title:	E-UTRAN -> UE	UE -> E-UTRAN	Ν	Notes
RRC Connection Contr				
RRC connection establishment	RRCConnectionSetu p or RRCConnectionResu me	RRCConnectionSetupCo mplete or RRCConnectionResumeC omplete	15 or 3	N = 3 applies for the case of reception of <i>RRCConnectionResume</i> if <i>reducedCP-</i> <i>LatencyEnabled</i> is configured, the UE supports reduced CP latency, and the RRC message only includes MAC and PHY (re- )configurations and does not include (re- )configurations of DRX, SPS, SCells, and MIMO. Further, the UL grant is sent using PDCCH DCI format 0 in common search space. In this scenario, the RRC procedure delay can extend beyond the reception of the UL grant, up to 7 ms. For other cases N = 15
RRC connection	RRCConnectionRele		NA	applies.
release	ase			
RRC connection re- configuration (radio resource configuration)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection re- configuration (measurement configuration)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection re- configuration (intra- LTE mobility)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection reconfiguration (SCell addition/release)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	20	
RRC connection reconfiguration (SCG establishment/ release, SCG cell addition/ release)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	20	
RRC connection re- configuration (NR measurement configuration)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	15	
RRC connection reconfiguration (NR SCG establishment/ /modification/release)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	20	
RRC connection re- configuration (intra- LTE mobility with NR SCG establishment/ /modification/release)	RRCConnectionReco nfiguration	RRCConnectionReconfigu rationComplete	20	
RRC connection re- establishment	RRCConnectionRees tablishment	RRCConnectionReestabli shmentComplete	15	

Procedure title:	E-UTRAN -> UE	UE -> E-UTRAN	Ν	Notes
Initial security	SecurityModeComma	SecurityModeCommandC	10	
activation	nd	omplete/SecurityModeCo mmandFailure		
Initial security	SecurityModeComma	RRCConnectionReconfigu	20	The two DL messages are
activation + RRC	nd,	rationComplete		transmitted in the same TTI
connection re-	RRCConnectionReco			
configuration (RB	nfiguration			
establishment)				
EDT	RRCEarlyDataCompl		NA	
	ete or			
	RRCConnectionRele			
Danian	ase for UP-EDT		NIA	
Paging	Paging		NA	
Inter RAT mobility			N1.0	
Handover to E-UTRA	RRCConnectionReco	RRCConnectionReconfigu	NA	The performance of this
	nfiguration (sent by	rationComplete		procedure is specified in TS 45.010 [50] in case of
	other RAT)			
				handover from GSM and TS 25.133 [29], TS 25.123
				[30] in case of handover
				from UTRA.
Handover from E-	MobilityFromEUTRA		NA	The performance of this
UTRA	Command			procedure is specified in
<b>U</b> ////	Sommana			TS 36.133 [16]
Handover from E-	HandoverFromEUTR		NA	Used to trigger the
UTRA to CDMA2000	APreparationRequest		1.17.1	handover preparation
	(CDMA2000)			procedure with a
	(02.00.000)			CDMA2000 RAT.
				The performance of this
				procedure is specified in
				TS 36.133 [16]
Measurement procedu	res			· · · ·
Measurement		MeasurementReport	NA	
Reporting Other procedures				
UE capability transfer	UECapabilityEnquiry	UECapabilityInformation	10/ 80	N = 80 applies in case the
	OECapabilityEnquily	Occapabilitymionnation	10/ 00	UE has to report at least
				one of the following UE
				capabilities.
				- MR-DC band
				combinations.
				compinations.
				- NR band combinations
				- NR band combinations - FUTRA feature sets
Counter check	CounterCheck	CounterCheckResponse	10	- NR band combinations - EUTRA feature sets
Counter check Proximity indication	CounterCheck	CounterCheckResponse ProximityIndication	10 NA	
Counter check Proximity indication UE information	CounterCheck UEInformationReque	CounterCheckResponse ProximityIndication UEInformationResponse	10 NA 15	
Proximity indication		ProximityIndication	NA	
Proximity indication	UEInformationReque	ProximityIndication	NA	
Proximity indication UE information	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse	NA 15	
Proximity indication UE information MBMS counting	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse	NA 15 NA	
Proximity indication UE information MBMS counting MBMS interest	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse	NA 15 NA	
Proximity indication UE information MBMS counting MBMS interest indication	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication	NA 15 NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication	NA 15 NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication InDeviceCoexIndication UEAssistanceInformation	NA 15 NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication InDeviceCoexIndication	NA 15 NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication InDeviceCoexIndication UEAssistanceInformation SCGFailureInformation	NA 15 NA NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information NR SCG failure	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication InDeviceCoexIndication UEAssistanceInformation	NA 15 NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information NR SCG failure information	UEInformationReque st MBMSCountingRequ	ProximityIndication         UEInformationResponse         MBMSCountingResponse         MBMSInterestIndication         InDeviceCoexIndication         UEAssistanceInformation         SCGFailureInformationNR	NA 15 NA NA NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information NR SCG failure information Sidelink UE	UEInformationReque st MBMSCountingRequ	ProximityIndication UEInformationResponse MBMSCountingResponse MBMSInterestIndication InDeviceCoexIndication UEAssistanceInformation SCGFailureInformation	NA 15 NA NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information NR SCG failure information Sidelink UE information	UEInformationReque st MBMSCountingRequ	ProximityIndication         UEInformationResponse         MBMSCountingResponse         MBMSInterestIndication         InDeviceCoexIndication         UEAssistanceInformation         SCGFailureInformation         SCGFailureInformation         SidelinkUEInformation	NA 15 NA NA NA NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information NR SCG failure information Sidelink UE information WLAN Connection	UEInformationReque st MBMSCountingRequ	ProximityIndication         UEInformationResponse         MBMSCountingResponse         MBMSInterestIndication         InDeviceCoexIndication         UEAssistanceInformation         SCGFailureInformation         SidelinkUEInformation         WLANConnectionStatusR	NA 15 NA NA NA NA NA	
Proximity indication UE information MBMS counting MBMS interest indication In-device coexistence indication UE assistance information SCG failure information NR SCG failure information Sidelink UE information	UEInformationReque st MBMSCountingRequ	ProximityIndication         UEInformationResponse         MBMSCountingResponse         MBMSInterestIndication         InDeviceCoexIndication         UEAssistanceInformation         SCGFailureInformation         SCGFailureInformation         SidelinkUEInformation	NA 15 NA NA NA NA NA NA	

Procedure title:	E-UTRAN -> UE	UE -> E-UTRAN	Ν	Notes	
RRC Connection Control Procedures					
RRC connection establishment	RRCConnectionSetu p-NB or RRCConnectionResu me-NB	RRCConnectionSetupCo mplete-NB or RRCConnectionResumeC omplete-NB	45		
RRC connection release	RRCConnectionRele ase-NB		NA		
RRC connection re- configuration (radio resource configuration)	RRCConnectionReco nfiguration-NB	RRCConnectionReconfigu rationComplete-NB	45		
RRC connection re- establishment	RRCConnectionRees tablishment-NB	RRCConnectionReestabli shmentComplete-NB	45		
Initial security activation	SecurityModeComma nd	SecurityModeCommandC omplete/SecurityModeCo mmandFailure	35		
Initial security activation + RRC connection re- configuration (RB establishment)	SecurityModeComma nd, RRCConnectionReco nfiguration-NB	RRCConnectionReconfigu rationComplete-NB	55	The two DL messages are transmitted in the same TTI	
EDT	RRCEarlyDataCompl ete-NB or RRCConnectionRele ase-NB for UP-EDT		NA		
Paging	Paging-NB		NA		
Other procedures	1				
UE capability transfer	UECapabilityEnquiry- NB	UECapabilityInformation- NB	35		

## Table 11.2-2: UE performance requirements for RRC procedures for NB-IoT UEs

# 11.3 Void

## Annex A (informative): Guidelines, mainly on use of ASN.1

Editor's note No agreements have been reached concerning the extension of RRC PDUs so far. Any statements in this clause about the protocol extension mechanism should be considered as FFS.

### A.1 Introduction

The following clauses contain guidelines for the specification of RRC protocol data units (PDUs) with ASN.1.

## A.2 Procedural specification

#### A.2.1 General principles

The procedural specification provides an overall high level description regarding the UE behaviour in a particular scenario.

It should be noted that most of the UE behaviour associated with the reception of a particular field is covered by the applicable parts of the PDU specification. The procedural specification may also include specific details of the UE behaviour upon reception of a field, but typically this should be done only for cases that are not easy to capture in the PDU clause e.g. general actions, more complicated actions depending on the value of multiple fields.

Likewise, the procedural specification need not specify the UE requirements regarding the setting of fields within the messages that are send to E-UTRAN i.e. this may also be covered by the PDU specification.

#### A.2.2 More detailed aspects

The following more detailed conventions should be used:

- Bullets:
  - Capitals should be used in the same manner as in other parts of the procedural text i.e. in most cases no capital applies since the bullets are part of the sentence starting with 'The UE shall:'
  - All bullets, including the last one in a sub-clause, should end with a semi-colon i.e. an ';'
- Conditions
  - Whenever multiple conditions apply, a semi-colon should be used at the end of each conditions with the exception of the last one, i.e. as in 'if cond1; or cond2:

### A.3 PDU specification

#### A.3.1 General principles

#### A.3.1.1 ASN.1 sections

The RRC PDU contents are formally and completely described using abstract syntax notation (ASN.1), see X.680 [13], X.681 (02/2002) [14].

The complete ASN.1 code is divided into a number of ASN.1 sections in the specifications. In order to facilitate the extraction of the complete ASN.1 code from the specification, each ASN.1 section begins with a text paragraph consisting entirely of an *ASN.1 start tag*, which consists of a double hyphen followed by a single space and the text string "ASN1START" (in all upper case letters). Each ASN.1 section ends with a text paragraph consisting entirely of an *ASN.1 stop tag*, which consists of a double hyphen followed by a single space and the text "ASN1STOP" (in all upper case letters):

-- ASN1START

-- ASN1STOP

The text paragraphs containing the ASN.1 start and stop tags should not contain any ASN.1 code significant for the complete description of the RRC PDU contents. The complete ASN.1 code may be extracted by copying all the text paragraphs between an ASN.1 start tag and the following ASN.1 stop tag in the order they appear, throughout the specification.

NOTE: A typical procedure for extraction of the complete ASN.1 code consists of a first step where the entire RRC PDU contents description (ultimately the entire specification) is saved into a plain text (ASCII) file format, followed by a second step where the actual extraction takes place, based on the occurrence of the ASN.1 start and stop tags.

#### A.3.1.2 ASN.1 identifier naming conventions

The naming of identifiers (i.e., the ASN.1 field and type identifiers) should be based on the following guidelines:

- Message (PDU) identifiers should be ordinary mixed case without hyphenation. These identifiers, *e.g.*, the *RRCConnectionModificationCommand*, should be used for reference in the procedure text. Abbreviated forms of these identifiers should not be used.
- Type identifiers other than PDU identifiers should be ordinary mixed case, with hyphenation used to set off acronyms only where an adjacent letter is a capital, *e.g.*, *EstablishmentCause*, *SelectedPLMN* (not *Selected-PLMN*, since the "d" in "Selected" is lowercase), *InitialUE-Identity* and *MeasSFN-SFN-TimeDifference*.
- Field identifiers shall start with a lowercase letter and use mixed case thereafter, *e.g.*, *establishmentCause*. If a field identifier begins with an acronym (which would normally be in upper case), the entire acronym is lowercase (*plmn-Identity*, not *pLMN-Identity*). The acronym is set off with a hyphen (*ue-Identity*, not *ueIdentity*), in order to facilitate a consistent search pattern with corresponding type identifiers.
- Identifiers that are likely to be keywords of some language, especially widely used languages, such as C++ or Java, should be avoided to the extent possible.
- Identifiers, other than PDU identifiers, longer than 25 characters should be avoided where possible. It is recommended to use abbreviations, which should be done in a consistent manner i.e. use 'Meas' instead of 'Measurement' for all occurrences. Examples of typical abbreviations are given in table A.3.1.2.1-1 below.
- For future extension: When an extension is introduced a suffix is added to the identifier of the concerned ASN.1 field and/ or type. A suffix of the form "-rX" is used, with X indicating the release, for ASN.1 fields or types introduced in a later release (i.e. a release later than the original/ first release of the protocol) as well as for ASN.1 fields or types for which a revision is introduced in a later release replacing a previous version, *e.g., Foo-r9* for the Rel-9 version of the ASN.1 type *Foo.* A suffix of the form "-rXb" is used for the first revision of a field that it appears in the same release (X) as the original version of the field, "-rXc" for a second intra-release revision and so on. A suffix of the form "-vXYZ" is used for ASN.1 fields or types that only are an extension of a corresponding earlier field or type (see sub-clause A.4), e.g., *AnElement-v10b0* for the extension of the ASN.1 type *AnElement* introduced in version 10.11.0 of the specification. A number 0...9, 10, 11, etc. is used to represent the first part of the version number, indicating the release of the protocol. Lower case letters *a*, *b*, *c*, etc. are used to represent the second (and third) part of the version number if they are greater than 9. In the procedural specification, in field descriptions as well as in headings suffices are not used, unless there is a clear need to distinguish the extension from the original field.
- More generally, in case there is a need to distinguish different variants of an ASN.1 field or IE, a suffix should be added at the end of the identifiers e.g. *MeasObjectUTRA*, *ConfigCommon*. When there is no particular need to distinguish the fields (e.g. because the field is included in different IEs), a common field identifier name may be used. This may be attractive e.g. in case the procedural specification is the same for the different variants.

Abbreviation	Abbreviated word	
Comm	Communication	
Conf	Confirmation	
Config	Configuration	
Disc	Discovery	
DL	Downlink	
Ext	Extension	
Freq	Frequency	
ld	Identity	
Ind	Indication	
Info	Information	
Meas	Measurement	
Neigh	Neighbour(ing)	
Param(s)	Parameter(s)	
Persist	Persistent	
Phys	Physical	
Proc	Process	
Reestab	Reestablishment	
Req	Request	
Rx	Reception	
Sched	Scheduling	
Sync	Synchronisation	
Thresh	Threshold	
Tx/ Transm	Transmission	
UL	Uplink	

Table A.3.1.2-1: Examples of typical abbreviations used in ASN.1 identifiers

NOTE: The table A.3.1.2.1-1 is not exhaustive. Additional abbreviations may be used in ASN.1 identifiers when needed.

#### A.3.1.3 Text references using ASN.1 identifiers

A text reference into the RRC PDU contents description from other parts of the specification is made using the ASN.1 field or type identifier of the referenced element. The ASN.1 field and type identifiers used in text references should be in the *italic font style*. The "do not check spelling and grammar" attribute in Word should be set. Quotation marks (i.e., " ") should not be used around the ASN.1 field or type identifier.

A reference to an RRC PDU type should be made using the corresponding ASN.1 type identifier followed by the word "message", e.g., a reference to the *RRCConnectionRelease* message.

A reference to a specific part of an RRC PDU, or to a specific part of any other ASN.1 type, should be made using the corresponding ASN.1 field identifier followed by the word "field", e.g., a reference to the *prioritisedBitRate* field in the example below.

```
-- /example/ ASN1START
LogicalChannelConfig ::=
                                    SEQUENCE {
    ul-SpecificParameters
                                        SEQUENCE {
                                            Priority,
       priority
        prioritisedBitRate
                                            PrioritisedBitRate,
        bucketSizeDuration
                                            BucketSizeDuration,
        logicalChannelGroup
                                            INTEGER (0..3)
            OPTIONAL
    1
}
```

```
-- ASN1STOP
```

NOTE: All the ASN.1 start tags in the ASN.1 sections, used as examples in this annex to the specification, are deliberately distorted, in order not to include them when the ASN.1 description of the RRC PDU contents is extracted from the specification.

A reference to a specific type of information element should be made using the corresponding ASN.1 type identifier preceded by the acronym "IE", e.g., a reference to the IE *LogicalChannelConfig* in the example above.

References to a specific type of information element should only be used when those are generic, i.e., without regard to the particular context wherein the specific type of information element is used. If the reference is related to a particular context, e.g., an RRC PDU type (message) wherein the information element is used, the corresponding field identifier in that context should be used in the text reference.

A reference to a specific value of an ASN.1 field should be made using the corresponding ASN.1 value without using quotation marks around the ASN.1 value, e.g., 'if the *status* field is set to value *true*'.

#### A.3.2 High-level message structure

Within each logical channel type, the associated RRC PDU (message) types are alternatives within a CHOICE, as shown in the example below.

```
-- /example/ ASN1START
DL-DCCH-Message ::= SEQUENCE {
    message
                           DL-DCCH-MessageType
}
DL-DCCH-MessageType ::= CHOICE {
                           CHOICE {
   с1
        dlInformationTransfer
                                                DLInformationTransfer,
        handoverFromEUTRAPreparationRequest
                                               HandoverFromEUTRAPreparationRequest,
        mobilityFromEUTRACommand
                                               MobilityFromEUTRACommand,
        rrcConnectionReconfiguration
                                                RRCConnectionReconfiguration,
        rrcConnectionRelease
                                               RRCConnectionRelease,
        securityModeCommand
                                                SecurityModeCommand,
        ueCapabilityEnguiry
                                                UECapabilityEnquiry,
        sparel NULL
    },
    messageClassExtension SEQUENCE { }
}
  ASN1STOP
```

A nested two-level CHOICE structure is used, where the alternative PDU types are alternatives within the inner level *c1* CHOICE.

Spare alternatives (i.e., *spare1* in this case) may be included within the *c1* CHOICE to facilitate future extension. The number of such spare alternatives should not extend the total number of alternatives beyond an integer-power-of-two number of alternatives (i.e., eight in this case).

Further extension of the number of alternative PDU types is facilitated using the *messageClassExtension* alternative in the outer level CHOICE.

#### A.3.3 Message definition

Each PDU (message) type is specified in an ASN.1 section similar to the one shown in the example below.

```
-- /example/ ASN1START
RRCConnectionReconfiguration ::= SEQUENCE {
   rrc-TransactionIdentifier
                                      RRC-TransactionIdentifier,
                                      CHOICE {
                                          CHOICE {
       c1
           rrcConnectionReconfiguration-r8
                                              RRCConnectionReconfiguration-r8-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
        }.
       criticalExtensionsFuture
                                           SEQUENCE { }
   }
}
RRCConnectionReconfiguration-r8-IEs ::= SEQUENCE {
   -- Enter the IEs here.
    . . .
}
-- ASN1STOP
```

Hooks for *critical* and *non-critical* extension should normally be included in the PDU type specification. How these hooks are used is further described in sub-clause A.4.

Critical extensions are characterised by a redefinition of the PDU contents and need to be governed by a mechanism for protocol version agreement between the encoder and the decoder of the PDU, such that the encoder is prevented from sending a critically extended version of the PDU type, which is not comprehended by the decoder.

Critical extension of a PDU type is facilitated by a two-level CHOICE structure, where the alternative PDU contents are alternatives within the inner level *c1* CHOICE. Spare alternatives (i.e., *spare3* down to *spare1* in this case) may be included within the *c1* CHOICE. The number of spare alternatives to be included in the original PDU specification should be decided case by case, based on the expected rate of critical extension in the future releases of the protocol.

Further critical extension, when the spare alternatives from the original specifications are used up, is facilitated using the *criticalExtensionsFuture* in the outer level CHOICE.

In PDU types where critical extension is not expected in the future releases of the protocol, the inner level *c1* CHOICE and the spare alternatives may be excluded, as shown in the example below.

Non-critical extensions are characterised by the addition of new information to the original specification of the PDU type. If not comprehended, a non-critical extension may be skipped by the decoder, whilst the decoder is still able to complete the decoding of the comprehended parts of the PDU contents.

Non-critical extensions at locations other than the end of the message or other than at the end of a field contained in a BIT or OCTET STRING are facilitated by use of the ASN.1 extension marker "...". The original specification of a PDU type should normally include the extension marker at the end of the sequence of information elements contained.

Non-critical extensions at the end of the message or at the end of a field that is contained in a BIT or OCTET STRING are facilitated by use of an empty sequence that is marked OPTIONAL e.g. as shown in the following example:

/example/ ASN1START			
<pre>RRCMessage-r8-IEs ::=    field1    field2    nonCriticalExtension }</pre>	<pre>SEQUENCE {     InformationElement1,     InformationElement2,     SEQUENCE {}</pre>	OPTIONAL	
ASN1STOP			

The ASN.1 section specifying the contents of a PDU type may be followed by a *field description* table where a further description of, e.g., the semantic properties of the fields may be included. The general format of this table is shown in the example below. The field description table is absent in case there are no fields for which further description needs to be provided e.g. because the PDU does not include any fields, or because an IE is defined for each field while there is nothing specific regarding the use of this IE that needs to be specified.

%PDU-TypeIdentifier% field descriptions	
%field identifier%	
Field description.	
%field identifier%	
Field description.	

The field description table has one column. The header row shall contain the ASN.1 type identifier of the PDU type.

The following rows are used to provide field descriptions. Each row shall include a first paragraph with a *field identifier* (in *bold and italic* font style) referring to the part of the PDU to which it applies. The following paragraphs at the same row may include (in regular font style), e.g., semantic description, references to other specifications and/ or specification of value units, which are relevant for the particular part of the PDU.

The parts of the PDU contents that do not require a field description shall be omitted from the field description table.

#### A.3.4 Information elements

Each IE (information element) type is specified in an ASN.1 section similar to the one shown in the example below.

```
-- /example/ ASN1START
PRACH-ConfigSTB ::=
                                    SEQUENCE {
                                        INTEGER (0..1023),
   rootSequenceIndex
   prach-ConfigInfo
                                        PRACH-ConfigInfo
}
                                    SEQUENCE {
PRACH-Config ::=
   rootSequenceIndex
                                        INTEGER (0..1023),
   prach-ConfigInfo
                                        PRACH-ConfigInfo
                                                                            OPTIONAL
                                                                                         -- Need ON
}
PRACH-ConfigInfo ::=
                                    SEQUENCE {
    prach-ConfigIndex
                                       ENUMERATED {ffs},
    highSpeedFlag
                                        ENUMERATED {ffs},
    zeroCorrelationZoneConfig
                                        ENUMERATED {ffs}
}
-- ASN1STOP
```

IEs should be introduced whenever there are multiple fields for which the same set of values apply. IEs may also be defined for other reasons e.g. to break down a ASN.1 definition in to smaller pieces.

A group of closely related IE type definitions, like the IEs *PRACH-ConfigSIB* and *PRACH-Config* in this example, are preferably placed together in a common ASN.1 section. The IE type identifiers should in this case have a common base, defined as the *generic type identifier*. It may be complemented by a suffix to distinguish the different variants. The "*PRACH-Config*" is the generic type identifier in this example, and the "*SIB*" suffix is added to distinguish the variant. The sub-clause heading and generic references to a group of closely related IEs defined in this way should use the generic type identifier.

The same principle should apply if a new version, or an extension version, of an existing IE is created for *critical* or *non-critical* extension of the protocol (see sub-clause A.4). The new version, or the extension version, of the IE is included in the same ASN.1 section defining the original. A suffix is added to the type identifier, using the naming conventions defined in sub-clause A.3.1.2, indicating the release or version of the where the new version, or extension version, was introduced.

Local IE type definitions, like the IE *PRACH-ConfigInfo* in the example above, may be included in the ASN.1 section and be referenced in the other IE types defined in the same ASN.1 section. The use of locally defined IE types should be encouraged, as a tool to break up large and complex IE type definitions. It can improve the readability of the code. There may also be a benefit for the software implementation of the protocol end-points, as these IE types are typically provided by the ASN.1 compiler as independent data elements, to be used in the software implementation.

An IE type defined in a local context, like the IE *PRACH-ConfigInfo*, should not be referenced directly from other ASN.1 sections in the RRC specification. An IE type which is referenced in more than one ASN.1 section should be defined in a separate sub-clause, with a separate heading and a separate ASN.1 section (possibly as one in a set of

closely related IE types, like the IEs *PRACH-ConfigSIB* and *PRACH-Config* in the example above). Such IE types are also referred to as 'global IEs'.

NOTE: Referring to an IE type, that is defined as a local IE type in the context of another ASN.1 section, does not generate an ASN.1 compilation error. Nevertheless, using a locally defined IE type in that way makes the IE type definition difficult to find, as it would not be visible at an outline level of the specification. It should be avoided.

The ASN.1 section specifying the contents of one or more IE types, like in the example above, may be followed by a *field description* table, where a further description of, e.g., the semantic properties of the fields of the information elements may be included. This table may be absent, similar as indicated in sub-clause A.3.3 for the specification of the *PDU* type. The general format of the *field description* table is the same as shown in sub-clause A.3.3 for the specification of the PDU type.

#### A.3.5 Fields with optional presence

A field with optional presence may be declared with the keyword DEFAULT. It identifies a default value to be assumed, if the sender does not include a value for that field in the encoding:

```
-- /example/ ASN1START
PreambleInfo ::= SEQUENCE {
    numberOfRA-Preambles INTEGER (1..64) DEFAULT 1,
    ...
}
-- ASN1STOP
```

Alternatively, a field with optional presence may be declared with the keyword OPTIONAL. It identifies a field for which a value can be omitted. The omission carries semantics, which is different from any normal value of the field:

```
-- /example/ ASN1START
PRACH-Config ::= SEQUENCE {
    rootSequenceIndex INTEGER (0..1023),
    prach-ConfigInfo PRACH-ConfigInfo OPTIONAL -- Need ON
}
-- ASN1STOP
```

The semantics of an optionally present field, in the case it is omitted, should be indicated at the end of the paragraph including the keyword OPTIONAL, using a short comment text with a need statement. The need statement includes the keyword "Need", followed by one of the predefined semantics tags (OP, ON or OR) defined in sub-clause 6.1. If the semantics tag OP is used, the semantics of the absent field are further specified either in the field description table following the ASN.1 section, or in procedure text.

The addition of OPTIONAL keywords for capability groups is based on the following guideline. If there is more than one field in the lower level IE, then OPTIONAL keyword is added at the group level. If there is only one field in the lower level IE, OPTIONAL keyword is not added at the group level.

#### A.3.6 Fields with conditional presence

A field with conditional presence is declared with the keyword OPTIONAL. In addition, a short comment text shall be included at the end of the paragraph including the keyword OPTIONAL. The comment text includes the keyword "Cond", followed by a condition tag associated with the field ("UL" in this example):

```
-- /example/ ASN1START
LogicalChannelConfig ::= SEQUENCE {
    ul-SpecificParameters SEQUENCE {
        priority INTEGER (0),
        ...
    } OPTIONAL
}
-- ASN1STOP
```

-- Cond UL

When conditionally present fields are included in an ASN.1 section, the field description table after the ASN.1 section shall be followed by a *conditional presence* table. The conditional presence table specifies the conditions for including the fields with conditional presence in the particular ASN.1 section.

Conditional presence	Explanation
UL	Specification of the conditions for including the field associated with the condition
	tag = "UL". Semantics in case of optional presence under certain conditions may
	also be specified.

The conditional presence table has two columns. The first column (heading: "Conditional presence") contains the condition tag (in *italic* font style), which links the fields with a condition tag in the ASN.1 section to an entry in the table. The second column (heading: "Explanation") contains a text specification of the conditions and requirements for the presence of the field. The second column may also include semantics, in case of an optional presence of the field, under certain conditions i.e. using the same predefined tags as defined for optional fields in A.3.5.

Conditional presence should primarily be used when presence of a field despends on the presence and/ or value of other fields within the same message. If the presence of a field depends on whether another feature/ function has been configured, while this function can be configured indepedently e.g. by another message and/ or at another point in time, the relation is best reflected by means of a statement in the field description table.

If the ASN.1 section does not include any fields with conditional presence, the conditional presence table shall not be included.

Whenever a field is only applicable in specific cases e.g. TDD, use of conditional presence should be considered.

#### A.3.7 Guidelines on use of lists with elements of SEQUENCE type

Where an information element has the form of a list (the SEQUENCE OF construct in ASN.1) with the type of the list elements being a SEQUENCE data type, an information element shall be defined for the list elements even if it would not otherwise be needed.

For example, a list of PLMN identities with reservation flags is defined as in the following example:

```
-- /example/ ASN1START
PLMN-IdentityInfoList ::= SEQUENCE (SIZE (1..6)) OF PLMN-IdentityInfo
PLMN-IdentityInfo ::= SEQUENCE {
    plmn-Identity PLMN-Identity,
    cellReservedForOperatorUse ENUMERATED {reserved, notReserved}
}
-- ASN1STOP
```

rather than as in the following (bad) example, which may cause generated code to contain types with unpredictable names:

```
-- /bad example/ ASN1START
PLMN-IdentityList ::= SEQUENCE (SIZE (1..6)) OF SEQUENCE {
    plmn-Identity cellReservedForOperatorUse ENUMERATED {reserved, notReserved}
}
-- ASN1STOP
```

## A.4 Extension of the PDU specifications

### A.4.1 General principles to ensure compatibility

It is essential that extension of the protocol does not affect interoperability i.e. it is essential that implementations based on different versions of the RRC protocol are able to interoperate. In particular, this requirement applies for the following kind of protocol extensions:

- Introduction of new PDU types (i.e. these should not cause unexpected behaviour or damage).
- Introduction of additional fields in an extensible PDUs (i.e. it should be possible to ignore uncomprehended extensions without affecting the handling of the other parts of the message).
- Introduction of additional values of an extensible field of PDUs. If used, the behaviour upon reception of an uncomprehended value should be defined.

It should be noted that the PDU extension mechanism may depend on the logical channel used to transfer the message e.g. for some PDUs an implementation may be aware of the protocol version of the peer in which case selective ignoring of extensions may not be required.

The non-critical extension mechanism is the primary mechanism for introducing protocol extensions i.e. the critical extension mechanism is used merely when there is a need to introduce a 'clean' message version. Such a need appears when the last message version includes a large number of non-critical extensions, which results in issues like readability, overhead associated with the extension markers. The critical extension mechanism may also be considered when it is complicated to accommodate the extensions by means of non-critical extension mechanisms.

### A.4.2 Critical extension of messages and fields

The mechanisms to critically extend a message are defined in A.3.3. There are both "outer branch" and "inner branch" mechanisms available. The "outer branch" consists of a CHOICE having the name *criticalExtensions*, with two values, *c1* and *criticalExtensionsFuture*. The *criticalExtensionsFuture* branch consists of an empty SEQUENCE, while the c1 branch contains the "inner branch" mechanism.

The "inner branch" structure is a CHOICE with values of the form "*MessageName-rX-IEs*" (e.g., "*RRCConnectionReconfiguration-r8-IEs*") or "*spareX*", with the spare values having type NULL. The "-rX-IEs" structures contain the *complete* structure of the message IEs for the appropriate release; i.e., the critical extension branch for the Rel-10 version of a message includes all Rel-8 and Rel-9 fields (that are not obviated in the later version), rather than containing only the additional Rel-10 fields.

The following guidelines may be used when deciding which mechanism to introduce for a particular message, i.e. only an 'outer branch', or an 'outer branch' in combination with an 'inner branch' including a certain number of spares:

- For certain messages, e.g. initial uplink messages, messages transmitted on a broadcast channel, critical extension may not be applicable.
- An outer branch may be sufficient for messages not including any fields.
- The number of spares within inner branch should reflect the likelihood that the message will be critically extended in future releases (since each release with a critical extension for the message consumes one of the spare values). The estimation of the critical extension likelyhood may be based on the number, size and changeability of the fields included in the message.
- In messages where an inner branch extension mechanism is available, all spare values of the inner branch should be used before any critical extensions are added using the outer branch.

The following example illustrates the use of the critical extension mechanism by showing the ASN.1 of the original and of a later release

/example/ ASN1START	Original release
RRCMessage ::= rrc-TransactionIdentifier	SEQUENCE { RRC-TransactionIdentifier,
criticalExtensions	CHOICE {
cl	CHOICE {

```
RRCMessage-r8-IEs,
            rrcMessage-r8
            spare3 NULL, spare2 NULL, spare1 NULL
        }.
        criticalExtensionsFuture
                                             SEQUENCE { }
    }
-- ASN1STOP
-- /example/ ASN1START
                                         -- Later release
                                         SEQUENCE {
RRCMessage ::=
    rrc-TransactionIdentifier
                                            RRC-TransactionIdentifier,
    criticalExtensions
                                         CHOICE {
                                            CHOICE {
       c1
            rrcMessage-r8
                                                 RRCMessage-r8-IEs,
            rrcMessage-r10
                                                 RRCMessage-r10-IEs,
            rrcMessage-r11
                                                 RRCMessage-r11-IEs,
            rrcMessage-r14
                                                 RRCMessage-r14-IEs
        },
        later
                                         CHOICE {
            c2
                                                 CHOICE {
                                                     RRCMessage-r16-IEs,
                rrcMessage-r16
                spare7 NULL, spare6 NULL, spare5 NULL, spare4 NULL,
                spare3 NULL, spare2 NULL, spare1 NULL
            }
            criticalExtensionsFuture
                                                     SEQUENCE { }
        }
    }
}
-- ASN1STOP
```

It is important to note that critical extensions may also be used at the level of individual fields i.e. a field may be replaced by a critically extended version. When sending the extended version, the original version may also be included (e.g. original field is mandatory, EUTRAN is unaware if UE supports the extended version). In such cases, a UE supporting both versions may be required to ignore the original field. The following example illustrates the use of the critical extension mechanism by showing the ASN.1 of the original and of a later release

```
-- /example/ ASN1START
                                       -- Original release
RRCMessage ::=
                                       SEQUENCE {
   rrc-TransactionIdentifier
                                           RRC-TransactionIdentifier,
    criticalExtensions
                                       CHOICE {
                                           CHOICE {
       c1
           rrcMessage-r8
                                               RRCMessage-r8-IEs,
           spare3 NULL, spare2 NULL, spare1 NULL
        },
        criticalExtensionsFuture
                                           SEQUENCE { }
    }
}
RRCMessage-rN-IEs ::= SEQUENCE {
                                       ENUMERATED {
   field1-rN
                                           value1, value2, value3, value4} OPTIONAL,
                                                                                       -- Need ON
    field2-rN
                                      InformationElement2-rN
                                                                          OPTIONAL,
                                                                                      -- Need ON
    nonCriticalExtension
                                      RRCConnectionReconfiguration-vMxy-IEs OPTIONAL
}
RRCConnectionReconfiguration-vMxy-IEs ::= SEQUENCE {
                                                                       OPTIONAL, -- Cond NoField2rN
   field2-rM
                                      InformationElement2-rM
                                       SEQUENCE { }
   nonCriticalExtension
                                                                       OPTIONAL
}
-- ASN1STOP
```

Conditional presence	Explanation	
NoField2rN	The field is optionally present, need ON, if <i>field2-rN</i> is absent. Otherwise the field is not	
	present	

Finally, it is noted that a critical extension may be introduced in the same release as the one in which the original field was introduced e.g. to correct an essential ASN.1 error. In such cases a UE capability may be introduced, to assist E-UTRAN in deciding whether or not to use the critically extension.

#### A.4.3 Non-critical extension of messages

#### A.4.3.1 General principles

The mechanisms to extend a message in a non-critical manner are defined in A.3.3. W.r.t. the use of extension markers, the following additional guidelines apply:

- When further non-critical extensions are added to a message that has been critically extended, the inclusion of these non-critical extensions in earlier critical branches of the message should be avoided when possible.
- The extension marker ("...") is the primary non-critical extension mechanism that is used unless a length determinant is not required. Examples of cases where a length determinant is not required:
  - at the end of a message,
  - at the end of a structure contained in a BIT STRING or OCTET STRING
- When an extension marker is available, non-critical extensions are preferably placed at the location (e.g. the IE) where the concerned parameter belongs from a logical/ functional perspective (referred to as the '*default extension location*')
- It is desirable to aggregate extensions of the same release or version of the specification into a group, which should be placed at the lowest possible level.
- In specific cases it may be preferrable to place extensions elsewhere (referred to as the '*actual extension location*') e.g. when it is possible to aggregate several extensions in a group. In such a case, the group should be placed at the lowest suitable level in the message. <TBD: ref to seperate example>
- In case placement at the default extension location affects earlier critical branches of the message, locating the extension at a following higher level in the message should be considered.
- In case an extension is not placed at the default extension location, an IE should be defined. The IE's ASN.1 definition should be placed in the same ASN.1 section as the default extension location. In case there are intermediate levels in-between the actual and the default extension location, an IE may be defined for each level. Intermediate levels are primarily introduced for readability and overview. Hence intermediate levels need not allways be introduced e.g. they may not be needed when the default and the actual extension location are within the same ASN.1 section. <TBD: ref to seperate example>

#### A.4.3.2 Further guidelines

Further to the general principles defined in the previous clause, the following additional guidelines apply regarding the use of extension markers:

- Extension markers within SEQUENCE
  - Extension markers are primarily, but not exclusively, introduced at the higher nesting levels
  - Extension markers are introduced for a SEQUENCE comprising several fields as well as for information elements whose extension would result in complex structures without it (e.g. re-introducing another list)
  - Extension markers are introduced to make it possible to maintain important information structures e.g. parameters relevant for one particular RAT
  - Extension markers are also used for size critical messages (i.e. messages on BCCH, BR-BCCH, PCCH and CCCH), although introduced somewhat more carefully
  - The extension fields introduced (or frozen) in a specific version of the specification are grouped together using double brackets.
- Extension markers within ENUMERATED

- Spare values are used until the number of values reaches the next power of 2, while the extension marker caters for extension beyond that limit
- A suffix of the form "vXYZ" is used for the identifier of each new value, e.g. "value-vXYZ".
- Extension markers within CHOICE:
  - Extension markers are introduced when extension is foreseen and when comprehension is not required by the receiver i.e. behaviour is defined for the case where the receiver cannot comprehend the extended value (e.g. ignoring an optional CHOICE field). It should be noted that defining the behaviour of a receiver upon receiving a not comprehended choice value is not required if the sender is aware whether or not the receiver supports the extended value.
  - A suffix of the form "vXYZ" is used for the identifier of each new choice value, e.g. "choice-vXYZ".

Non-critical extensions at the end of a message/ of a field contained in an OCTET or BIT STRING:

- When a nonCriticalExtension is actually used, a "Need" statement should not be provided for the field, which always is a group including at least one extension and a field facilitating further possible extensions. For simplicity, it is recommended not to provide a "Need" statement when the field is not actually used either.

Further, more general, guidelines:

-- /example/ ASN1START

- In case a need statement is not provided for a group, a "Need" statement is provided for all individual extension fields within the group i.e. including for fields that are not marked as OPTIONAL. The latter is to clarify the action upon absence of the whole group.

#### A.4.3.3 Typical example of evolution of IE with local extensions

The following example illustrates the use of the extension marker for a number of elementary cases (sequence, enumerated, choice). The example also illustrates how the IE may be revised in case the critical extension mechanism is used.

NOTE In case there is a need to support further extensions of release n while the ASN.1 of release (n+1) has been frozen, without requiring the release n receiver to support decoding of release (n+1) extensions, more advanced mechanisms are needed e.g. including multiple extension markers.

```
InformationElement1 ::=
                                SEQUENCE {
                                        ENUMERATED {
    field1
                                            value1, value2, value3, value4-v880,
                                             ..., value5-v960 },
    field2
                                        CHOTCE {
        field2a
                                            BOOLEAN,
        field2b
                                            InformationElement2b,
        field2c-v960
                                             InformationElement2c-r9
    },
    [[
      field3-r9
                                            InformationElement3-r9
                                                                         OPTIONAL
                                                                                          -- Need OR
    ]],
    [[ field3-v9a0
                                             InformationElement3-v9a0 OPTIONAL,
                                                                                          -- Need OR
        field4-r9
                                             InformationElement4
                                                                     OPTIONAL
                                                                                          -- Need OR
    11
}
InformationElement1-r10 ::=
                                    SEQUENCE {
                                        ENUMERATED {
    field1
                                            value1, value2, value3, value4-v880,
                                             value5-v960, value6-v1170, spare2, spare1, ... },
    field2
                                         CHOICE {
       field2a
                                            BOOLEAN.
        field2b
                                             InformationElement2b,
        field2c-v960
                                             InformationElement2c-r9,
        . . . ,
       field2d-v12b0
                                            INTEGER (0..63)
    field3-r9
                                        InformationElement3-r10
                                                                         OPTIONAL,
                                                                                     -- Need OR
    field4-r9
                                         InformationElement4
                                                                         OPTIONAL,
                                                                                     -- Need OR
    field5-r10
                                         BOOLEAN,
```

```
912
```

```
field6-r10 InformationElement6-r10 OPTIONAL, -- Need OR
    [[ field3-v1170 InformationElement3-v1170 OPTIONAL -- Need OR
    ]]
}
-- ASN1STOP
```

Some remarks regarding the extensions of *InformationElement1* as shown in the above example:

- The *InformationElement1* is initially extended with a number of non-critical extensions. In release 10 however, a critical extension is introduced for the message using this IE. Consequently, a new version of the IE *InformationElement1* (i.e. *InformationElement1-r10*) is defined in which the earlier non-critical extensions are incorporated by means of a revision of the original field.
- The value4-v880 is replacing a spare value defined in the original protocol version for *field1*. Likewise value6v1170 replaces spare3 that was originally defined in the r10 version of *field1*
- Within the critically extended release 10 version of *InformationElement1*, the names of the original fields/ IEs are not changed, unless there is a real need to distinguish them from other fields/ IEs. E.g. the *field1* and *InformationElement4* were defined in the original protocol version (release 8) and hence not tagged. Moreover, the *field3-r9* is introduced in release 9 and not re-tagged; although, the *InformationElement3* is also critically extended and therefore tagged *InformationElement3-r10* in the release 10 version of InformationElement1.

#### A.4.3.4 Typical examples of non critical extension at the end of a message

The following example illustrates the use of non-critical extensions at the end of the message or at the end of a field that is contained in a BIT or OCTET STRING i.e. when an empty sequence is used.

/example/ ASN1START		
<pre>RRCMessage-r8-IEs ::=     field1     field2     field3     nonCriticalExtension }</pre>	SEQUENCE { InformationElement1, InformationElement2, InformationElement3 RRCMessage-v860-IEs	OPTIONAL, Need ON OPTIONAL
<pre>RRCMessage-v860-IEs ::=    field4-v860    field5-v860    nonCriticalExtension }</pre>	SEQUENCE { InformationElement4 BOOLEAN RRCMessage-v940-IEs	OPTIONAL, Need OP OPTIONAL, Cond C54 OPTIONAL
RRCMessage-v940-IEs ::= field6-v940 nonCriticalExtensions }	SEQUENCE { InformationElement6-r9 SEQUENCE {}	OPTIONAL, Need OR OPTIONAL
ASN1STOP		

Some remarks regarding the extensions shown in the above example:

- The *InformationElement4* is introduced in the original version of the protocol (release 8) and hence no suffix is used.

## A.4.3.5 Examples of non-critical extensions not placed at the default extension location

The following example illustrates the use of non-critical extensions in case an extension is not placed at the default extension location.

#### ParentIE-WithEM

The IE *ParentIE-WithEM* is an example of a high level IE including the extension marker (EM). The root encoding of this IE includes two lower level IEs *ChildIE1-WithoutEM* and *ChildIE2-WithoutEM* which not include the extension marker. Consequently, non-critical extensions of the Child-IEs have to be included at the level of the Parent-IE.

The example illustrates how the two extension IEs *ChildIE1-WithoutEM-vNx0* and *ChildIE2-WithoutEM-vNx0* (both in release N) are used to connect non-critical extensions with a default extension location in the lower level IEs to the actual extension location in this IE.

#### ParentIE-WithEM information element

/example/ ASN1START			
ParentIE-WithEM ::= Root encoding, including:	SEQUENCE {		
childIE1-WithoutEM	ChildIE1-WithoutEM	OPTIONAL,	Need ON
childIE2-WithoutEM	ChildIE2-WithoutEM	OPTIONAL,	Need ON
<pre>, [[ childIE1-WithoutEM-vNx0</pre>	ChildIE1-WithoutEM-vNx0 ChildIE2-WithoutEM-vNx0	OPTIONAL, OPTIONAL	Need ON Need ON
}			

Some remarks regarding the extensions shown in the above example:

-- ASN1STOP

- The fields *childIEx-WithoutEM-vNx0* may not really need to be optional (depends on what is defined at the next lower level).
- In general, especially when there are several nesting levels, fields should be marked as optional only when there is a clear reason.

#### ChildIE1-WithoutEM

The IE *ChildIE1-WithoutEM* is an example of a lower level IE, used to control certain radio configurations including a configurable feature which can be setup or released using the local IE *ChIE1-ConfigurableFeature*. The example illustrates how the new field *chIE1-NewField* is added in release N to the configuration of the configurable feature. The example is based on the following assumptions:

- when initially configuring as well as when modifying the new field, the original fields of the configurable feature have to be provided also i.e. as if the extended ones were present within the setup branch of this feature.
- when the configurable feature is released, the new field should be released also.
- when omitting the original fields of the configurable feature the UE continues using the existing values (which is
  used to optimise the signalling for features that typically continue unchanged upon handover).
- when omitting the new field of the configurable feature the UE releases the existing values and discontinues the
  associated functionality (which may be used to support release of unsupported functionality upon handover to an
  eNB supporting an earlier protocol version).

The above assumptions, which affect the use of conditions and need codes, may not always apply. Hence, the example should not be re-used blindly.

# -- /example/ ASNISTART ChildIE1-WithoutEM ::= SEQUENCE { -- Root encoding, including: chIE1-ConfigurableFeature ChIE1-ConfigurableFeature OPTIONAL -- Need ON }

#### ChildIE1-WithoutEM information elements

```
ChildIE1-WithoutEM-vNx0 ::=
                                SEQUENCE {
                                        ChIE1-ConfigurableFeature-vNx0 OPTIONAL
    chIE1-ConfigurableFeature-vNx0
                                                                                     -- Cond ConfigF
}
ChIE1-ConfigurableFeature ::=
                                    CHOICE {
   release
                                       NULL,
                                        SEQUENCE {
    setup
        -- Root encoding
    1
}
ChIE1-ConfigurableFeature-vNx0 ::= SEQUENCE {
                                        INTEGER (0..31)
    chIE1-NewField-rN
}
-- ASN1STOP
```

Conditional presence	Explanation
ConfigF	The field is optional present, need OR, in case of <i>chIE1-ConfigurableFeature</i> is included and set to "setup"; otherwise the field is not present and the UE shall delete any existing value for this field.

#### ChildIE2-WithoutEM

The IE *ChildIE2-WithoutEM* is an example of a lower level IE, typically used to control certain radio configurations. The example illustrates how the new field *chIE1-NewField* is added in release N to the configuration of the configurable feature.

#### ChildIE2-WithoutEM information element

CHOICE { NULL, SEQUENCE {		
SEQUENCE { INTEGER (031)	OPTIONAL	Cond ConfigF
	NULL, SEQUENCE { SEQUENCE {	NULL, SEQUENCE { SEQUENCE {

Conditional presence	Explanation
ConfigF	The field is optional present, need OR, in case of <i>chIE2-ConfigurableFeature</i> is included and set to "setup"; otherwise the field is not present and the UE shall delete any existing value for this field.

## A.5 Guidelines regarding inclusion of transaction identifiers in RRC messages

The following rules provide guidance on which messages should include a Transaction identifier

- 1: DL messages on CCCH that move UE to RRC-Idle should not include the RRC transaction identifier.
- 2: All network initiated DL messages by default should include the RRC transaction identifier.
- 3: All UL messages that are direct response to a DL message with an RRC Transaction identifier should include the RRC Transaction identifier.
- 4: All UL messages that require a direct DL response message should include an RRC transaction identifier.

5: All UL messages that are not in response to a DL message nor require a corresponding response from the network should not include the RRC Transaction identifier.

## A.6 Protection of RRC messages (informative)

The following list provides information which messages can be sent (unprotected) prior to security activation and which messages can be sent unprotected after security activation. Those messages indicated "-" in "P" column should never be sent unprotected by eNB or UE. Further requirements are defined in the procedural text.

P...Messages that can be sent (unprotected) prior to security activation

- A I...Messages that can be sent without integrity protection after security activation
- A C...Messages that can be sent unciphered after security activation
- NA... Message can never be sent after security activation

Message	P	A-I	A-C	Comment
CSFBParametersRequestCDMA20 00	+	-	-	
CSFBParametersResponseCDMA 2000	+	-	-	
CounterCheck	-	-	-	
CounterCheckResponse	-	-	-	
DelayBudgetReport	-	-	-	
DLInformationTransfer	+	-	-	
FailureInformation	-	-	-	
HandoverFromEUTRAPreparation	-	-	-	
Request (CDMA2000)				
InDeviceCoexIndication	-	-	-	
InterFreqRSTDMeasurementIndica	-	-	-	
tion				
LoggedMeasurementsConfiguratio	-	-	-	
n				
MasterInformationBlock	+	+	+	
MasterInformationBlock-MBMS	+	+	+	
MBMSCountingRequest	+	+	+	
MBMSCountingResponse	-	-	-	
MBMSInterestIndication	+	-	-	
MBSFNAreaConfiguration	+	+	+	
MeasReportAppLayer	-	-	-	
MeasurementReport	-		-	Measurement configuration may be sent
measurementkeport	-	-	-	prior to security activation. But: In order to protect privacy of UEs, MEASUREMENT REPORT is only sent from the UE after successful security activation.
MobilityFromEUTRACommand	-	-	-	
Paging	+	+	+	
ProximityIndication	-		-	
RNReconfiguration	-	-	-	
RNReconfigurationComplete	-	-	-	
RRCConnectionReconfiguration	+	-	-	The message shall not be sent unprotected before security activation if it is used to perform handover or to establish SRB2, SRB4 and DRBs
RRCConnectionReconfigurationCo mplete	+	-	-	Unprotected, if sent as response to RRCConnectionReconfiguration which was sent before security activation
RRCConnectionReestablishment	-	+	+	This message is not protected by PDCP operation.
RRCConnectionReestablishmentC omplete	-	-	-	
RRCConnectionReestablishmentR eject	-	+	+	One reason to send this may be that the security context has been lost, therefore sent as unprotected.
RRCConnectionReestablishmentR equest	-	-	+	This message is not protected by PDCP operation. However, a short MAC-I is included.
RRCConnectionReject	+	+	+	Except for UP-EDT, A-I and A-C are NA.
RRCConnectionRelease	+	-	-	Justification for P: If the RRC connection only for signalling not requiring DRBs or ciphered messages, or the signalling connection has to be released prematurely this message is sent as unprotected. For UP-EDT, the message is only sent after successful security activation. <i>RRCConnectionRelease</i> message sent before security activation cannot include <i>rrc-InactiveConfig, redirectedCarrierInfo,</i>
RRCConnectionRequest	+	NA	NA	<i>idleModeMobilityControlInfo</i> information fields when UE is connected to 5GC.

Message	P	A-I	A-C	Comment
RRCConnectionResume	-	-	+	When this message is transmitted, security is activated but suspended. Integrity verification is done after the message received by RRC. For UP-EDT, the message is only sent after successful security activation. For RRC_INACTIVE state, the message is protected with both integrity and ciphering.
RRCConnectionResumeRequest	-	-	+	This message is not protected by PDCP operation. However, a short MAC-I is included.
RRCConnectionResumeComplete	-	-	-	
RRCConnectionSetup	+	NA	NA	
RRCConnectionSetupComplete	+	NA	NA	
RRCEarlyDataRequest	+	NA	NA	
RRCEarlyDataComplete	+	NA	NA	
SCGFailureInformation	-	-	-	
SCGFailureInformationNR	-	-	-	
SCPTMConfiguration	+	+	+	
SecurityModeCommand	+	NA	NA	Integrity protection applied, but no ciphering (integrity verification done after the message received by RRC)
SecurityModeComplete	-	NA	NA	Integrity protection applied, but no ciphering. Ciphering is applied after completing the procedure.
SecurityModeFailure	+	NA	NA	Neither integrity protection nor ciphering applied.
SidelinkUEInformation	+	-	-	
SystemInformation	+	+	+	
SystemInformationBlockType1	+	+	+	
SystemInformationBlockType1- MBMS	+	+	+	
UEAssistanceInformation	-	-	-	
UECapabilityEnquiry	+	-	-	
UECapabilityInformation	+	-	-	
UEInformationRequest	-	-	-	
UEInformationResponse	-	-	-	In order to protect privacy of UEs, UEInformationResponse is only sent from the UE after successful security activation
ULHandoverPreparationTransfer (CDMA2000)	-	-	-	This message should follow HandoverFromEUTRAPreparationRequest
ULInformationTransfer	+	-	-	
ULInformationTransferMRDC	-	-	-	
WLANConnectionStatusReport	-	-	-	

## A.7 Miscellaneous

The following miscellaneous conventions should be used:

- References: Whenever another specification is referenced, the specification number and optionally the relevant clause, table or figure, should be indicated in addition to the pointer to the References clause e.g. as follows: 'see TS 36.212 [22, 5.3.3.1.6]'.
- UE capabilities: TS 36.306 [5] specifies that E-UTRAN should in general respect the UE's capabilities. Hence there is no need to include statement clarifying that E-UTRAN, when setting the value of a certain configuration field, shall respect the related UE capabilities unless there is a particular need e.g. particularly complicated cases.

## Annex B (normative): Release 8 and 9 AS feature handling

## B.1 Feature group indicators

This annex contains the definitions of the bits in fields *featureGroupIndicators* (in Table B.1-1) and *featureGroupIndRel9Add* (in Table B.1-1a).

In this release of the protocol, the UE shall include the fields *featureGroupIndicators* in the IE *UE-EUTRA-Capability* and *featureGroupIndRel9Add* in the IE *UE-EUTRA-Capability-v9a0*. All the functionalities defined within the field *featureGroupIndicators* defined in Table B.1-1 or Table B.1-1a are mandatory for the UE (with exceptions for category M1 and M2 UEs), if the related capability (frequency band, RAT, SR-VCC or Inter-RAT ANR) is also supported. For a specific indicator, if all functionalities for a feature group listed in Table B.1-1 have been implemented and tested, the UE shall set the indicator as one (1), else (i.e. if any one of the functionalities in a feature group listed in Table B.1-1 or Table B.1-1a, which have not been implemented or tested), the UE shall set the indicator as zero (0).

The UE shall set all indicators that correspond to RATs not supported by the UE as zero (0).

The UE shall set all indicators, which do not have a definition in Table B.1-1 or Table B.1-1a, as zero (0).

If the optional fields *featureGroupIndicators* or *featureGroupIndRel9Add* are not included by a UE of a future release, the network may assume that all features pertaining to the RATs supported by the UE, respectively listed in Table B.1-1 or Table B.1-1a and deployed in the network, have been implemented and tested by the UE.

In Table B.1-1, a 'VoLTE capable UE' corresponds to a UE which is IMS voice capable and a 'MCPTT capable UE' corresponds to a UE which supports MCPTT voice application as defined in TS 23.179 [73].

The indexing in Table B.1-1a starts from index 33, which is the leftmost bit in the field *featureGroupIndRel9Add*.

Index of indicator (bit number)	<b>Definition</b> (description of the supported functionality, if indicator set to one)	Notes	If indicated "Yes" the feature shall be implemented and successfully tested for this version of the specification	FDD/ TDD diff
1 (leftmost bit)	<ul> <li>Intra-subframe frequency hopping for PUSCH scheduled by UL grant</li> <li>DCI format 3a (TPC commands for PUCCH and PUSCH with single bit power adjustments)</li> <li>Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 – UE selected subband CQI without PMI</li> <li>Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected subband CQI with multiple PMI</li> </ul>	- set to 1 by category M1 and M2 UEs that have implemented and successfully tested "Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 – UE selected subband CQI without PMI"		Yes
2	<ul> <li>Simultaneous CQI and ACK/NACK on PUCCH, i.e. PUCCH format 2a and 2b</li> <li>Absolute TPC command for PUSCH</li> <li>Resource allocation type 1 for PDSCH</li> <li>Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-0 – UE selected subband CQI without PMI</li> <li>Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-1 – UE selected subband CQI with single PMI</li> </ul>	- If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.		Yes
3	- 5bit RLC UM SN - 7bit PDCP SN	- can only be set to 1 if the UE has set bit number 7 to 1.	Yes, if UE supports VoLTE, MCPTT, or both.	No

#### Table B.1-1: Definitions of feature group indicators

Yes, if UE supports SRVCC to EUTRAN
from GERAN.

4	- Short DRX cycle	- can only be set to 1 if the UE has set bit		Yes
		number 5 to 1. - not supported by category M1 or M2		
		UE		
5	- Long DRX cycle     - DRX command MAC control element		Yes	No
6	- Prioritised bit rate		Yes	No
7	- RLC UM	- can only be set to 0 if the UE does neither support VoLTE nor MCPTT	Yes, if UE supports VoLTE, MCPTT, or both. Yes, if UE supports SRVCC to EUTRAN from GERAN.	No
8	- EUTRA RRC_CONNECTED to UTRA FDD or UTRA TDD CELL_DCH PS handover, if the UE supports either only UTRAN FDD or only UTRAN TDD - EUTRA RRC_CONNECTED to UTRA FDD CELL_DCH PS handover, if the UE	- can only be set to 1 if the UE has set bit number 22 to 1	Yes (except for category M1 and M2 UEs) for FDD, if UE supports UTRA FDD.	Yes
	supports both UTRAN FDD and UTRAN			
9	- EUTRA RRC_CONNECTED to GERAN GSM_Dedicated handover	<ul> <li>related to SR-VCC</li> <li>can only be set to 1</li> <li>if the UE has set bit</li> <li>number 23 to 1</li> </ul>	Yes (except for category M1 and M2 UEs), if UE supports SRVCC to EUTRAN from GERAN.	Yes
10	<ul> <li>EUTRA RRC_CONNECTED to GERAN (Packet_) Idle by Cell Change Order</li> <li>EUTRA RRC_CONNECTED to GERAN (Packet_) Idle by Cell Change Order with NACC (Network Assisted Cell Change)</li> </ul>			Yes
11	- EUTRA RRC_CONNECTED to CDMA2000 1xRTT CS Active handover	<ul> <li>related to SR-VCC</li> <li>can only be set to 1</li> <li>if the UE has sets bit</li> <li>number 24 to 1</li> </ul>		Yes
12	- EUTRA RRC_CONNECTED to CDMA2000 HRPD Active handover	- can only be set to 1 if the UE has set bit number 26 to 1		Yes
13	- Inter-frequency handover (within FDD or TDD)	- can only be set to 1 if the UE has set bit number 25 to 1	Yes (except for category M1 and M2 UEs), unless UE only supports band 13	No
14	<ul> <li>Measurement reporting event: Event</li> <li>A4 – Neighbour &gt; threshold</li> <li>Measurement reporting event: Event</li> <li>A5 – Serving &lt; threshold1 &amp; Neighbour</li> <li>&gt; threshold2</li> </ul>		Yes (except for category M1 and M2 UEs)	No
15	<ul> <li>Measurement reporting event: Event B1 – Neighbour &gt; threshold for UTRAN FDD or UTRAN TDD, if the UE supports either only UTRAN FDD or only UTRAN TDD and has set bit number 22 to 1</li> <li>Measurement reporting event: Event B1 – Neighbour &gt; threshold for UTRAN FDD or UTRAN TDD, if the UE supports both UTRAN FDD and UTRAN TDD and has set bit number 22 or 39 to 1, respectively</li> <li>Measurement reporting event: Event B1 – Neighbour &gt; threshold for GERAN, 1xRTT or HRPD, if the UE has set bit number 23, 24 or 26 to 1, respectively</li> </ul>	- can only be set to 1 if the UE has set at least one of the bit number 22, 23, 24, 26 or 39 to 1. - even if the UE sets bits 41, it shall still set bit 15 to 1 if measurement reporting event B1 is tested for all RATs supported by UE - If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.	Yes for FDD, if UE supports only UTRAN FDD and does not support UTRAN TDD or GERAN or 1xRTT or HRPD	Yes

16	- Intra-frequency periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and	- If a category M1 or M2 UE does not support this feature	Yes	No
	purpose is set to reportStrongestCells	group, this bit shall be set to 0.		
	- Inter-frequency periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> , if the UE has set bit number 25 to 1			
	- Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> for UTRAN FDD or UTRAN TDD, if the UE supports either only UTRAN FDD or only UTRAN TDD and has set bit number 22 to 1			
	- Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> for UTRAN FDD or UTRAN TDD, if the UE supports both UTRAN FDD and UTRAN TDD and has set bit number 22 or 39 to 1, respectively			
	- Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> for GERAN, 1xRTT or HRPD, if the UE has set bit number 23, 24 or 26 to 1, respectively.			
	NOTE: Event triggered periodical reporting (i.e., with <i>triggerType</i> set to <i>event</i> and with <i>reportAmount</i> > 1) is a mandatory functionality of event triggered reporting and therefore not the subject of this bit.			
17	<ul> <li>Intra-frequency ANR features (including the case of (NG)EN-DC wherein MN and SN have the same DRX cycle and on-duration configured by MN completely contains on-duration configured by SN) including: <ul> <li>Intra-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells</li> <li>Intra-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to reportStrongestCells</li> <li>Intra-frequency periodical measurement reporting where triggerType is set to periodical and purpose is set to periodical measurement reporting where triggerType is set to periodical measurement reporting where triggerType is set to periodical and purpose is set to reportCGI.</li> </ul> </li> </ul>	<ul> <li>can only be set to 1 if the UE has set bit number 5 to 1.</li> <li>If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.</li> </ul>	Yes	No
18	Inter-frequency ANR features (including the case of (NG)EN-DC wherein MN and SN have the same DRX cycle and on- duration configured by MN completely contains on-duration configured by SN) including: - Inter-frequency periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> - Inter-frequency periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> - Inter-frequency periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportCGI</i>	<ul> <li>can only be set to 1</li> <li>if the UE has set bit</li> <li>number 5 and bit</li> <li>number 25 to 1.</li> <li>If a category M1 or</li> <li>M2 UE does not</li> <li>support this feature</li> <li>group, this bit shall be</li> <li>set to 0.</li> </ul>	Yes, unless UE only supports band 13	No

19	Inter PAT ANP features (including the	can only be set to 1	Yes
19	Inter-RAT ANR features (including the case of (NG)EN-DC wherein MN and SN	<ul> <li>can only be set to 1</li> <li>if the UE has set bit</li> </ul>	res
	have the same DRX cycle and on-	number 5 to 1 and the	
	duration configured by MN completely	UE has set at least	
	contains on-duration configured by SN)	one of the bit number	
	including:	22, 23, 24 or 26 to 1.	
	- Inter-RAT periodical measurement		
	reporting where <i>triggerType</i> is set to	<ul> <li>even if the UE sets</li> <li>bits 33 to 37, it shall</li> </ul>	
		still set bit 19 to 1 if	
	periodical and purpose is set to reportStrongestCells for GERAN, if the	inter-RAT ANR	
	UE has set bit number 23 to 1	features are tested for	
	- Inter-RAT periodical measurement	all RATs for which	
	reporting where <i>triggerType</i> is set to	inter-RAT	
	periodical and purpose is set to	measurement	
	reportStrongestCellsForSON for UTRAN	reporting is indicated	
	FDD or UTRAN TDD, if the UE supports	as tested	
	either only UTRAN FDD or only UTRAN	as lested	
	TDD and has set bit number 22 to 1		
	- Inter-RAT periodical measurement		
	reporting where <i>triggerType</i> is set to		
	periodical and purpose is set to		
	reportStrongestCellsForSON for UTRAN		
	FDD or UTRAN TDD, if the UE supports		
	both UTRAN FDD and UTRAN TDD and		
	has set bit number 22 or 39 to 1,		
	respectively		
	- Inter-RAT periodical measurement		
	reporting where <i>triggerType</i> is set to		
	periodical and purpose is set to		
	reportStrongestCellsForSON for 1xRTT		
	or HRPD, if the UE has set bit number		
	24 or 26 to 1, respectively		
	- Inter-RAT periodical measurement		
	reporting where <i>triggerType</i> is set to		
	periodical and purpose is set to		
1	reportCGI for UTRAN FDD or UTRAN		
	TDD, if the UE supports either only		
	UTRAN FDD or only UTRANTDD and		
	has set bit number 22 to 1		
	<ul> <li>Inter-RAT periodical measurement</li> </ul>		
	reporting where <i>triggerType</i> is set to		
	periodical and purpose is set to		
	reportCGI for UTRAN FDD or UTRAN		
	TDD, if the UE supports both UTRAN		
	FDD and UTRAN TDD and has set bit		
	number 22 or 39 to 1, respectively		
	- Inter-RAT periodical measurement		
	reporting where <i>triggerType</i> is set to		
	periodical and purpose is set to		
	reportCGI for GERAN, 1xRTT or HRPD,		
	if the UE has set bit number 23, 24 or 26		
L	to 1, respectively		

20	If bit number 7 is set to 0:	- Regardless of what	Yes	No
20	- SRB1 and SRB2 for DCCH + 8x AM	bit number 7 and bit	165	NO
	DRB	number 20 is set to,		
		UE shall support at		
	If bit number 7 is set to 1:	least SRB1 and SRB2		
	- SRB1 and SRB2 for DCCH + 8x AM	for DCCH + 4x AM		
	DRB	DRB		
	- SRB1 and SRB2 for DCCH + 5x AM DRB + 3x UM DRB	- Regardless of what bit number 20 is set		
		to, if bit number 7 is		
	NOTE: UE which indicate support for a DRB combination also support all	set to 1, UE shall support at least SRB1		
	subsets of the DRB combination.	and SRB2 for DCCH		
	Therefore, release of DRB(s) never	+ 4x AM DRB + 1x		
	results in an unsupported DRB	UM DRB		
	combination.	- If flexibleUM-AM-		
		Combinations is		
		included the UE shall		
		support any		
		combination of RLC UM and RLC AM		
		bearers as long as		
		the total number of		
		bearers is at most 8,		
		regardless of what		
04		FGI20 indicates		N1-
21	- Predefined intra- and inter-subframe	<ul> <li>If a category M1 or M2 UE does not</li> </ul>		No
	frequency hopping for PUSCH with N_sb > 1	support this feature		
	- Predefined inter-subframe frequency	group, this bit shall be		
	hopping for PUSCH with N_sb > 1	set to 0.		
22	- UTRAN FDD or UTRAN TDD	- If a category M1 or	Yes for FDD, if UE	Yes
	measurements, reporting and	M2 UE does not	supports UTRA FDD	
	measurement reporting event B2 in E- UTRA connected mode, if the UE	support this feature group, this bit shall be		
	supports either only UTRAN FDD or only	set to 0.		
	UTRAN TDD			
	- UTRAN FDD measurements, reporting			
	and measurement reporting event B2 in			
	E-UTRA connected mode, if the UE			
	supports both UTRAN FDD and UTRAN			
	TDD			Ň
23	- GERAN measurements, reporting and measurement reporting event B2 in E-	<ul> <li>If a category M1 or M2 UE does not</li> </ul>		Yes
	UTRA connected mode	support this feature		
		group, this bit shall be		
		set to 0.		
24	- 1xRTT measurements, reporting and	- If a category M1 or	Yes for FDD, if UE	Yes
	measurement reporting event B2 in E- UTRA connected mode	M2 UE does not support this feature	supports enhanced 1xRTT CSFB for FDD	
		group, this bit shall be	Yes for TDD, if UE	
		set to 0.	supports enhanced	
			1xRTT CSFB for TDD	
25	- Inter-frequency measurements and	- A category M1 or M2	Yes, unless UE only	No
	reporting in E-UTRA connected mode	UE shall set this bit to	supports band 13	
	NOTE: The UE setting this bit to 1 and	1 only if ceMeasurements-r14		
	indicating support for FDD and TDD	is supported.		
	frequency bands in the UE capability			
	signalling implements and is tested for			
	FDD measurements while the UE is in			
	TDD, and for TDD measurements while			
	the UE is in FDD.		1	1

26	- HRPD measurements, reporting and measurement reporting event B2 in E- UTRA connected mode	- If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.	Yes for FDD, if UE supports HRPD	Yes
27	<ul> <li>EUTRA RRC_CONNECTED to UTRA FDD or UTRA TDD CELL_DCH CS handover, if the UE supports either only UTRAN FDD or only UTRAN TDD</li> <li>EUTRA RRC_CONNECTED to UTRA FDD CELL_DCH CS handover, if the UE supports both UTRAN FDD and UTRAN TDD</li> </ul>	<ul> <li>related to SR-VCC</li> <li>can only be set to 1 if the UE has set bit number 8 to 1 and supports SR-VCC from EUTRA defined in TS 24.008 [49]</li> <li>If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.</li> </ul>	Yes for FDD, if UE supports VoLTE and UTRA FDD	Yes
28	- TTI bundling	- If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.	Yes for FDD	Yes
29	- Semi-Persistent Scheduling	- If a category M1 or M2 UE does not support this feature group, this bit shall be set to 0.		Yes
30	- Handover between FDD and TDD	- can only be set to 1 if the UE has set bit number 13 to 1		No
31	<ul> <li>Indicates whether the UE supports the mechanisms defined for cells</li> <li>broadcasting multi band information i.e.</li> <li>comprehending <i>multiBandInfoList</i>,</li> <li>disregarding in RRC_CONNECTED the related system information fields and understanding the EARFCN signalling for all bands, that overlap with the bands supported by the UE, and that are defined in the earliest version of TS 36.101 [42] that includes all UE supported bands.</li> </ul>		Yes	No
32	Undefined			

NOTE: The column FDD/ TDD diff indicates if the UE is allowed to signal different values for FDD and TDD.

Table B.1-1a: Definitions of feature group indicators

Index of indicator (bit number)	<b>Definition</b> (description of the supported functionality, if indicator set to one)	Notes	If indicated "Yes" the feature shall be implemented and successfully tested for this version of the specification	FDD/ TDD diff
33 (leftmost bit)	Inter-RAT ANR features for UTRAN FDD (including the case of (NG)EN-DC wherein MN and SN have the same DRX cycle and on-duration configured by MN completely contains on-duration configured by SN) including: - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCellsForSON</i> - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to	- can only be set to 1 if the UE has set bit number 5 and bit number 22 to 1.		Yes
34	Inter-RAT ANR features for GERAN (including the case of (NG)EN-DC wherein MN and SN have the same DRX cycle and on-duration configured by MN completely contains on-duration configured by SN) including: - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCells</i> - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to	- can only be set to 1 if the UE has set bit number 5 and bit number 23 to 1.		Yes
35	Inter-RAT ANR features for 1xRTT (including the case of (NG)EN-DC wherein MN and SN have the same DRX cycle and on-duration configured by MN completely contains on-duration configured by SN) including: - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCellsForSON</i> - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportCGI</i>	- can only be set to 1 if the UE has set bit number 5 and bit number 24 to 1.		Yes
36	Inter-RAT ANR features for HRPD (including the case of (NG)EN-DC wherein MN and SN have the same DRX cycle and on-duration configured by MN completely contains on-duration configured by SN) including: - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to <i>reportStrongestCellsForSON</i> - Inter-RAT periodical measurement reporting where <i>triggerType</i> is set to <i>periodical</i> and <i>purpose</i> is set to	- can only be set to 1 if the UE has set bit number 5 and bit number 26 to 1.		Yes

			I	
37	Inter-RAT ANR features for UTRAN	- can only be set to 1		Yes
	TDD (including the case of (NG)EN-DC	if the UE has set bit		
	wherein MN and SN have the same	number 5 and at least		
	DRX cycle and on-duration configured	one of the bit number		
	by MN completely contains on-duration	22 (for UEs		
	configured by SN) including:	supporting only UTRA		
	- Inter-RAT periodical measurement	TDD) or the bit		
	reporting where <i>triggerType</i> is set to	number 39 to 1.		
	periodical and purpose is set to			
	reportStrongestCellsForSON			
	- Inter-RAT periodical measurement			
	reporting where <i>triggerType</i> is set to			
	periodical and purpose is set to			
	reportCGI			
38	- EUTRA RRC_CONNECTED to UTRA	- can only be set to 1		Yes
	TDD CELL_DCH PS handover, if the	if the UE has set bit		
	UE supports both UTRAN FDD and	number 39 to 1		
	UTRAN TDD			
39	- UTRAN TDD measurements, reporting	- If a category M1 or		Yes
	and measurement reporting event B2 in	M2 UE does not		
	E-UTRA connected mode, if the UE	support this feature		
	supports both UTRAN FDD and UTRAN	group, this bit shall be		
	TDD	set to 0.		
40	- EUTRA RRC_CONNECTED to UTRA	- related to SR-VCC		Yes
	TDD CELL_DCH CS handover, if the	- can only be set to 1		
	UE supports both UTRAN FDD and	if the UE has set bit		
	UTRAN TDD	number 38 to 1		
41	Measurement reporting event: Event B1	- If a category M1 or	Yes for FDD, unless UE	Yes
	<ul> <li>Neighbour &gt; threshold for UTRAN</li> </ul>	M2 UE does not	has set bit number 15 to	
	FDD, if the UE supports UTRAN FDD	support this feature	1	
	and has set bit number 22 to 1	group, this bit shall be		
		set to 0.		
42	- DCI format 3a (TPC commands for	- If a category M1 or		Yes
	PUCCH and PUSCH with single bit	M2UE supports this		
	power adjustments)	feature group, this bit		
		shall be set to 1. For		
		a UE of all other		
		categories, this bit		
		shall be set to 0.		
43	Undefined			
44	Undefined			
45	Undefined			
46	Undefined			
47	Undefined			
48	Undefined			
49	Undefined			
50	Undefined			
51	Undefined			
52	Undefined			
53	Undefined			ļ
54	Undefined			
55	Undefined			
56	Undefined			
57	Undefined			
58	Undefined			
59	Undefined			
60	Undefined			
61	Undefined			
62	Undefined			
~~	Undefined	1	1	1
63 64	Undefined			

NOTE: The column FDD/ TDD diff indicates if the UE is allowed to signal different values for FDD and TDD. Annex E specifies for which TDD and FDD serving cells a UE supporting TDD/FDD CA shall support a feature for which it indicates support within the FGI signalling.

#### Clarification for mobility from EUTRAN and inter-frequency handover within EUTRAN

There are several feature groups related to mobility from E-UTRAN and inter-frequency handover within EUTRAN. The description of these features is based on the assumption that we have 5 main "functions" related to mobility from E-UTRAN:

- A. Support of measurements and cell reselection procedure in idle mode
- B. Support of RRC release with redirection procedure in connected mode
- C. Support of Network Assisted Cell Change in connected mode
- D. Support of measurements and reporting in connected mode
- E. Support of handover procedure in connected mode

All functions can be applied for mobility to Inter-frequency to EUTRAN, GERAN, UTRAN, CDMA2000 HRPD and CDMA2000 1xRTT except for function C) which is only applicable for mobility to GERAN. Table B.1-2 below summarises the mobility functions that are supported based on the UE capability signaling (band support) and the setting of the feature group support indicators.

Feature	GERAN	UTRAN	HRPD	1xRTT	EUTRAN
A. Measurements and cell reselection procedure in E-UTRA idle mode	Supported if GERAN band support is indicated	Supported if UTRAN band support is indicated	Supported if CDMA2000 HRPD band support is indicated	Supported if CDMA2000 1xRTT band support is indicated	Supported fc supported bands
B. RRC release with blind redirection procedure in E-UTRA connected mode	Supported if GERAN band support is indicated	Supported if UTRAN band support is indicated	Supported if CDMA2000 HRPD band support is indicated	Supported if CDMA2000 1xRTT band support is indicated	Supported fc supported bands
C. Cell Change Order (with or without) Network Assisted Cell Change) in E- UTRA connected mode	Group 10	N.A.	N.A.	N.A.	N.A.
D. Inter-frequency/RAT measurements, reporting and measurement reporting event B2 (for inter-RAT) in E-UTRA connected mode	Group 23	Group 22/39	Group 26	Group 24	Group 25
E. Inter-frequency/RAT handover procedure in E-UTRA connected mode	Group 9 (GSM_connected handover) Separate UE capability bit defined in TS 36.306 [5] for PS handover	Group 8/38 (PS handover) or Group 27/40 (SRVCC handover)	Group 12	Group 11	Group 13 (within FDD TDD) Group 30 (between FE and TDD)

#### Table B.1-2: Mobility from E-UTRAN

In case measurements and reporting function is not supported by UE, the network may still issue the mobility procedures redirection (B) and CCO (C) in a blind fashion.

## B.2 CSG support

In this release of the protocol, it is mandatory for the UE to support a minimum set of CSG functionality consisting of:

- Identifying whether a cell is CSG or not;
- Ignoring CSG cells in cell selection/reselection.

Additional CSG functionality in AS, i.e. the requirement to detect and camp on CSG cells when the "CSG whitelist" is available or when manual CSG selection is triggered by the user, are related to the corresponding NAS features. This additional AS functionality consists of:

- Manual CSG selection;
- Autonomous CSG search;
- Implicit priority handling for cell reselection with CSG cells.

It is possible that this additional CSG functionality in AS is not supported or tested in early UE implementations.

Note that since the above AS features relate to idle mode operations, the capability support is not signalled to the network. For these reasons, no "feature group indicator" is assigned to this feature to indicate early support in Rel-8.

## Annex C (normative): Release 10 AS feature handling

## C.1 Feature group indicators

This annex contains the definitions of the bits in field *featureGroupIndRel10*.

In this release of the protocol, the UE shall include the field *featureGroupIndRel10* in the IE *UE-EUTRA-Capabilityv1020-IEs*. All the functionalities defined within the field *featureGroupIndRel10* defined in Table C.1-1 are mandatory for the UE, if the related capability (spatial multiplexing in UL, PDSCH transmission mode 9, carrier aggregation, handover to EUTRA, or RAT) is also supported. For a specific indicator, if all functionalities for a feature group listed in Table C.1-1 have been implemented and tested, the UE shall set the indicator as one (1), else (i.e. if any one of the functionalities in a feature group listed in Table C.1-1 have not been implemented or tested), the UE shall set the indicator as zero (0).

The UE shall set all indicators that correspond to RATs not supported by the UE as zero (0).

The UE shall set all indicators, which do not have a definition in Table C.1-1, as zero (0).

If the optional field *featureGroupIndRel10* is not included by a UE of a future release, the network may assume that all features, listed in Table C.1-1 and deployed in the network, have been implemented and tested by the UE.

The indexing in Table C.1-1 starts from index 101, which is the leftmost bit in the field *featureGroupIndRel10*.

Index of indicator	<b>Definition</b> (description of the supported functionality, if indicator set to one)	Notes	If indicated "Yes" the feature shall be implemented and successfully tested for this version of the specification	FDD/ TDD diff
101 (leftmost bit)	- DMRS with OCC (orthogonal cover code) and SGH (sequence group hopping) disabling	<ul> <li>if the UE supports two or more layers for spatial multiplexing in UL, this bit shall be set to 1.</li> <li>If a category 0 or 1bis UE does not support this feature, this bit shall be set to 0.</li> </ul>		No
102	<ul> <li>Trigger type 1 SRS (aperiodic SRS) transmission (Up to X ports)</li> <li>NOTE: X = number of supported layers on given band</li> </ul>			Yes
103	- PDSCH transmission mode 9 when up to 4 CSI reference signal ports are configured and when not operating in CE mode	<ul> <li>for Category 8 UEs, this bit shall be set to 1.</li> <li>for Category 11 and higher UEs, this bit shall be set to 1.</li> <li>for DL Category 11 and higher UEs (except for DL Category 13), this bit shall be set to 1.</li> </ul>	Yes for the UE categories listed in the column "Notes"	Yes

#### Table C.1-1: Definitions of feature group indicators

104	- PDSCH transmission mode 9 for TDD when 8 CSI reference signal ports are configured and when not operating in CE mode	<ul> <li>if the UE does not support TDD, this bit is irrelevant, and shall be set to 0.</li> <li>this bit is not applicable to FDD (capability signalling exists for FDD for this feature).</li> <li>for Category 8 UEs, this bit shall be set to 1.</li> <li>for Category 11 and higher UEs, this bit shall be set to 1.</li> <li>for DL Category 11 and higher UEs (except for DL Category 13), this bit shall be set to 1.</li> </ul>	Yes for TDD, for the UE categories listed in the column "Notes"	No
105	<ul> <li>Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-0 – UE selected subband CQI without PMI, when PDSCH transmission mode 9 is configured</li> <li>Periodic CQI/PMI/RI reporting on PUCCH: Mode 2-1 – UE selected subband CQI with single PMI, when PDSCH transmission mode 9 and up to 4 CSI reference signal ports are configured</li> </ul>	<ul> <li>this bit can be set to 1 only if indices 2 (Table B.1-1) and 103 are set to 1.</li> <li>For UEs capable of TDD- FDD CA, this bit can be set to 1 for both FDD and TDD if index 2 is set to 1 for both FDD and TDD, and index 103 is set to 1 for at least one of FDD and TDD duplex modes.</li> </ul>		Yes

		T	1	
106	- Periodic CQI/PMI/RI/PTI reporting on PUCCH: Mode 2-1 – UE selected subband CQI with single PMI, when PDSCH transmission mode 9 and 8 CSI reference signal ports are configured	- this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if <i>tm9- With-8Tx-FDD-r10</i> is set to 'supported') and if index 2 (Table B.1-1) is set to 1. - For UEs capable of TDD- FDD CA, this bit can be set to 1 for both FDD and TDD if at least one of index 104 and <i>tm9-With-8Tx-FDD-r10</i> is set to 1/'supported', and if index 2 is set to 1 for both FDD and TDD.		Yes
107	<ul> <li>Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-0 – UE selected subband CQI without PMI, when PDSCH transmission mode 9 is configured</li> <li>Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected subband CQI with multiple PMI, when PDSCH transmission mode 9 and up to 4 CSI reference signal ports are configured</li> </ul>	<ul> <li>this bit can be set to 1 only if indices 1 (Table B.1-1) and 103 are set to 1.</li> <li>For UEs capable of TDD- FDD CA, this bit can be set to 1 for both FDD and TDD if index 1 is set to 1 for both FDD and TDD, and index 103 is set to 1 for at least one of FDD and TDD duplex modes.</li> </ul>		Yes
108	- Aperiodic CQI/PMI/RI reporting on PUSCH: Mode 2-2 – UE selected subband CQI with multiple PMI, when PDSCH transmission mode 9 and 8 CSI reference signal ports are configured	- this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if <i>tm9- With-8Tx-FDD-r10</i> is set to 'supported') and if index 1 (Table B.1-1) is set to 1. - For UEs capable of TDD- FDD CA, this bit can be set to 1 for both FDD and TDD if at least one of index 104 and <i>tm9-With-8Tx-FDD-r10</i> is set to 1/'supported', and if index 1 is set to 1 for both FDD and TDD.		Yes
109	- Periodic CQI/PMI/RI reporting on PUCCH Mode 1-1, submode 1	<ul> <li>this bit can be set to 1 only if the UE supports PDSCH transmission mode 9 with 8 CSI reference signal ports (i.e., for TDD, if index 104 is set to 1, and for FDD, if <i>tm9- With-8Tx-FDD-r10</i> is set to 'supported').</li> <li>For UEs capable of TDD- FDD CA, this bit can be set to 1 for both FDD and TDD if at least one of index 104 and <i>tm9-With-8Tx-FDD-r10</i> is set to 1/'supported'.</li> </ul>		Yes

	- Periodic CQI/PMI/RI reporting on PUCCH Mode 1-1, submode 2	- this bit can be set to 1 only if the UE supports PDSCH	
		transmission mode 9 with 8	
		CSI reference signal ports	
		(i.e., for TDD, if index 104 is	
		set to 1, and for FDD, if tm9-	
		With-8Tx-FDD-r10 is set to	
		'supported').	
		- For UEs capable of TDD-	
		FDD CA, this bit can be set	
		to 1 for both FDD and TDD if	
		at least one of index 104 and	
		tm9-With-8Tx-FDD-r10 is set	
111	Maggurgement reporting trigger Event	to 1/'supported'.	Yes
111	- Measurement reporting trigger Event A6	- this bit can be set to 1 only if the UE supports carrier	res
	70	aggregation.	
112	- SCell addition within the handover to	- this bit can be set to 1 only	Yes
	EUTRA procedure	if the UE supports carrier	
	- · · · · · · · · · · · · · · · · · · ·	aggregation and the	
		handover to EUTRA	
		procedure.	
113	- Trigger type 0 SRS (periodic SRS)	- this bit can be set to 1 only	Yes
	transmission on X Serving Cells	if the UE supports carrier	
		aggregation in UL.	
	NOTE: X = number of supported		
	component carriers in a given band		
	combination		
114	- Reporting of both UTRA CPICH	- this bit can be set to 1 only	No
	RSCP and Ec/N0 in a Measurement Report	if index 22 (Table B.1-1) is set to 1.	
115	- time domain ICIC RLM/RRM	- If a category M1 or M2 UE	Yes
110	measurement subframe restriction for	does not support this feature	103
	the serving cell	group, this bit shall be set to	
	- time domain ICIC RRM measurement	0.	
	subframe restriction for neighbour cells		
	- time domain ICIC CSI measurement		
	subframe restriction		
116	- Relative transmit phase continuity for	- this bit can be set to 1 only	Yes
	spatial multiplexing in UL	if the UE supports two or	
		more layers for spatial	
447		multiplexing in UL.	
117 118	Undefined Undefined		
118	Undefined		
120	Undefined		
120	Undefined		
121	Undefined		
123	Undefined		
124	Undefined		
125	Undefined		
126	Undefined		
127	Undefined		
128	Undefined		
129	Undefined		
130	Undefined		
131	Undefined		
132	Undefined		

NOTE: The column FDD/ TDD diff indicates if the UE is allowed to signal different values for FDD and TDD. Annex E specifies for which TDD and FDD serving cells a UE supporting TDD/FDD CA shall support a feature for which it indicates support within the FGI signalling.

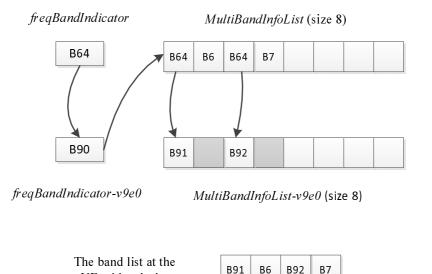
## Annex D (informative): Descriptive background information

D.1 Signalling of Multiple Frequency Band Indicators (Multiple FBI)

## D.1.1 Mapping between frequency band indicator and multiple frequency band indicator

This clause describes the use of the Multiple Frequency Band Indicator (MFBI) lists and the E-UTRA frequency bands in *SystemInformationBlockType1* by means of an example as shown in Figure D.1.1-1. In this example:

- E-UTRAN cell belongs to band B90 and also bands B6, B7, B91, and B92.
- The *freqBandIndicatorPriority* field is not present in *SystemInformationBlockType1*.
- E-UTRAN uses B64 to indicate the presence of B90 in freqBandIndicator-v9e0.
- For the MFBI list of this cell, E-UTRAN uses B64 in *MultiBandInfoList* to indicate the position and priority of the bands in *MultiBandInfoList-v9e0*.
- The UE, after reading *SystemInformationBlockType1*, generates an MFBI list with priority of B91, B6, B92, and B7. If the UE supports the frequency band in the *freqBandIndicator-v9e0* IE it applies that frequency band. Otherwise, the UE applies the first listed band in the MFBI list which it supports.



#### Figure D.1.1-1: Mapping of frequency bands to MultiBandInfoList/MultiBandInfoList-v9e0

## D.1.2 Mapping between inter-frequency neighbour list and multiple frequency band indicator

UE with priority

This clause describes the use of the Multiple Frequency Band Indicator (MFBI) lists and the E-UTRA frequencies signalled in *SystemInformationBlockType5* by means of an example as shown in Figure D.1.2-1. In this example:

- E-UTRAN includes 4 frequencies (EARFCNs): the bands associated with f1 and f4 belong to bands lower than 64; the bands associated with f2 and f3 belong to bands larger than 64. The reserved EARFCN value of 65535 is used to indicate the presence of *ARFCN-ValueEUTRA-v9e0*.

- The band associated with f1 has two overlapping bands, B1 and B2 (lower than 64); the band associated with f2 has one overlapping band, B91; the band associated with f3 has four overlapping bands B3, B4, B92, and B93; the band associated with f4 does not have overlapping bands.
- E-UTRAN includes 4 lists in both *interFreqCarrierFreqList-v8h0* and *interFreqCarrierFreqList-v9e0* and ensure the order of the lists is matching. Each list corresponds to one EARFCN and contains up to 8 bands. The first list corresponds to f1, the second list corresponds to f2, and so on. The grey lists mean not including *MultiBandInfoList* or *MultiBandInfoList-v9e0*, i.e. the corresponding EARFCN does not have any overlapping frequency bands in *MultiBandInfoList* or *MultiBandInfoList* or *MultiBandInfoList-v9e0*.





## D.1.3 Mapping between UTRA FDD frequency list and multiple frequency band indicator

This clause describes the use of the Multiple Frequency Band Indicator (MFBI) lists and the UTRA FDD frequencies signalled in *SystemInformationBlockType6* by means of an example as shown in Figure D.1.3-1. In this example:

- E-UTRAN includes 4 UTRA FDD frequencies (UARFCNs).
- The bands associated with f1 and f4 have no overlapping bands. The band associated with f2 has two overlapping bands, B1 and B2. The band associated with f3 has one overlapping band, B3.
- E-UTRAN includes 4 lists in *carrierFreqListUTRA-FDD-v8h0* with the first and fourth entry not including *MultiBandInfoList*.

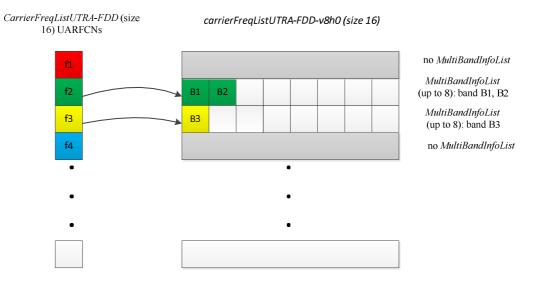


Figure D.1.3-1: Mapping of UARFCNs to MultiBandInfoList

# Annex E (normative): TDD/FDD differentiation of FGIs/capabilities in TDD-FDD CA

Annex E specifies for which TDD and FDD serving cells a UE supporting TDD/FDD CA shall support a feature/capability for which it indicates support within the FGI/capability signalling.

A UE that indicates support for TDD/ FDD CA:

- For the fields for which the UE is allowed to indicate different support for FDD and TDD, the UE shall support the feature on the PCell and/or SCell(s), as specified in tables E-1, E-2 and E-3 in accordance to the following rules:
  - PCell: the UE shall support the feature for the PCell, if the UE indicates support of the feature for the PCell duplex mode;
  - SCell: the UE shall support the feature for SCell(s), if the UE indicates support of the feature for the SCell duplex mode;
  - Per serving cell: the UE shall support the feature for a serving cell if the UE indicates support of the feature for the serving cell's duplex mode;
  - All serving cells: UE shall support the feature if the UE indicates support of the feature for both TDD and FDD duplex modes;
- For the fields where the UE is not allowed to indicate different support for FDD and TDD, the UE shall support the feature for PCell and SCell(s) if the UE indicates support of the feature via the common FGI/capability bit.

#### Table E-1: Rel-8/9 FGIs for which FDD/TDD differentiation is allowed (from Annex B)

Index of	Classification
indicator	
1	Per serving cell
2	All serving cells
4	All serving cells
8	PCell
9	PCell
10	PCell
11	PCell
12	PCell
15	PCell
19	PCell
22	PCell
23	PCell
24	PCell
26	PCell
27	PCell
28	PCell
29	PCell
33	PCell
34	PCell
35	PCell
36	PCell
37	PCell
38	PCell
39	PCell
40	PCell
41	PCell

Index of indicator	Classification
102	Per serving cell
103	Per serving cell
105	All serving cells
106	All serving cells
107	All serving cells
108	All serving cells
109	All serving cells
110	All serving cells
111	SCell
112	PCell
113	Per serving cell
115	PCell
116	Per serving cell

## Table E-2: Rel-10 FGIs for which FDD/TDD differentiation is allowed (from Annex C)

## Table E-3: Rel-12 UE-EUTRA capabilities for which FDD/TDD differentiation is allowed

UE-EUTRA-Capability	Classification
crossCarrierScheduling	All serving cells
e-CSFB-1XRTT	PCell
e-CSFB-ConcPS-Mob1XRTT	PCell
e-CSFB-dual-1XRTT	PCell
ePDCCH	Per serving cell
e-RedirectionUTRA	PCell
e-RedirectionUTRA-TDD	PCell
inDeviceCoexInd	All serving cells
interFreqRSTD-Measurement	PCell
interFreqSI-AcquisitionForHO	PCell
interRAT-PS-HO-ToGERAN	PCell
intraFreqSI-AcquisitionForHO	PCell
mbms-Scell	SCell
mbms-NonServingCell	SCell
multiACK-CSIreporting	PCell
multiClusterPUSCH-WithinCC	Per serving cell
otdoa-UE-Assisted	PCell
pmi-Disabling	Per serving cell
rsrqMeasWideband	Per serving cell
simultaneousPUCCH-PUSCH	All serving cells
ss-CCH-InterfHandl	PCell
txDiv-PUCCH1b-ChSelect	PCell
ue-TxAntennaSelectionSupported	All serving cells
utran-SI-AcquisitionForHO	PCell

# Annex F (normative): UE requirements on ASN.1 comprehension

This clause specifies UE requirements regarding the ASN.1 transfer syntax support i.e. the ASN.1 definitions to be comprehended by the UE.

A UE that indicates release X in field *accessStratumRelease* shall comprehend the entire transfer syntax (ASN.1) of release X, in particular at least the first version upon ASN.1 freeze. The UE is however not required to support dedicated signalling related transfer syntax associated with optional features it does not support.

In case a UE that indicates release X in field *accessStratumRelease* supports a feature specified in release X+ N (i.e. early UE implementation) additional requirements apply.

#### Cricitical extensions (dedicated signaling)

If the early implemented feature involves one or more critical extensions (i.e. case of dedicated signaling), the UE shall comprehend the parts of the transfer syntax (ASN.1) of release X+N that are related to the feature implemented early. This in particular concerns the ASN.1 parts related to configuration of the feature. The UE obviously also has to support the ASN.1 parts related to indicating support of the feature (in UE capabilities).

If configuration of an early implemented feature introduced in release X+N involves a message or field that has been critically extended, the UE shall support configuration of all features supported by the UE that are associated with sub-fields of this critical extension. Apart from the early implemented feature(s), the UE need however not support functionality beyond what is defined in the release the UE indicates in access stratum release.

Let's consider the example of a UE indicating value X in field *accessStratumRelease* that supports the features associated with fields A1, A3 and A5 of *InformationElementA* (see ASN.1 below). The feature implemented early is associated with field A5, and can only be configured by the -rX+N version of *InformationElementA*. In such case, the UE should support configuration of the features associated with fields A1, A3 and A5 by the -rX+N version of *InformationElementA*. In such case, the UE should support configuration of the features was modified, e.g. the feature associated with *fieldA3*, E-UTRAN should assume the UE only supports the feature according to the release it indicated in field *accessStratumRelease* (X). I.e. UE is neither required to support the additional code-point (*n80-vX+N0*) nor the additional sub-field (*fieldA3a*).

<pre>InformationElementA-rX ::=    fieldA1-rX    fieldA2-rX    fieldA3-rX }</pre>	SEQUENCE { InformationElementA1-rX InformationElementA2-rX InformationElementA3-rX	OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need OR Need OR
<pre>InformationElementA-rX+N ::=    fieldA1-rX+N    fieldA2-rX+N    fieldA3-rX+N    fieldA4-rX+N    fieldA4-rX+N    fieldA5-rX+N }</pre>	SEQUENCE { InformationElementA1-rX InformationElementA2-rX InformationElementA3-rX+N InformationElementA4-rX+N InformationElementA5-rX+N	OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need OR Need OR Need OR Need OR
<pre>InformationElementA3-rX+N ::=    fieldA1a-rX+N    fieldA2a-rX+N    fieldA3a-rX+N }</pre>	SEQUENCE { InformationElementAla-rX ENUMERATED {n10, n20, n40, n80-vX+N0} InformationElementA3a-rX+N	OPTIONAL, OPTIONAL, OPTIONAL	Need ON Need OR Need OR

#### Non-cricitical extensions (broadcast signaling)

If the early implemented feature involves one or more non-critical extensions in broadcast signaling (i.e. system information), the UE shall comprehend the parts of the transfer syntax (ASN.1) of release X + N that are related to the feature implemented early. The SIB(s) containing the release X + N fields related to the early implemented features may also include other extensions concerning releases from X upto X+N. The UE shall comprehend such intermediate fields (but again is not required to support the functionality associated with these intermediate fields, in case this concerns optional features not supported by the UE).

# Annex G (normative): List of CRs Containing Early Implementable Features and Corrections

This annex lists the Change Requests (CRs) whose changes may be implemented by a UE of an earlier release than which the CR was approved in (i.e. CRs that contain on their coversheets the sentence "Implementation of this CR from Rel-N will not cause interoperability issues").

### Table G-1: List of CRs Containing Early Implementable Features and Corrections

TDoc Number (RP-xxxxx): CR Title	CR Number(s)	CR Revision Number(s)	Earliest Implementable Release	Additional Information
RP-181233: Successful acknowledgement of RRCConnectionRelease for BL and CE UE	3324	1	Release 13	RRCConnectionRelease message, for which the poll bit is not set, can be considered succesfully acknowledged when UE has sent HARQ ACK feedback.
RP-182674: CR for T312 on LTE HetNet mobility	3506	5	Release 12	Remove T312 in leaving condition for event trigger.
RP-182671: Corrections on paging monitoring and SI acquisition in RRC_CONNECTED for BL UEs and UEs in CE	3647	2	Release 13	
RP-190548: Update description of ack-NACK- NumRepetitions	3899	2	Release 13	
RP-190548: Corrections of NB-IoT Access Barring	3900	2	Release 13	
RP-191382: SI update notification and access barring in NB-IoT	4020	2	Release 13	
RP-192195 : Correction on handling of SCell(s) during Make Before Break handover	3986	3	Release 14	
NOTE 1: In case a CR has min NOTE 2: The Additional Inform				ses where the CR title may not

NOTE 2: The Additional Information column briefly describes the content of a CR in cases where the CR title may not be descriptive enough. If the CR title is descriptive enough, then the Additional Information column may be left blank. Annex H (informative): Change history

	<b>TOO</b> "	700 0		-		Change history	
Date	ISG #	TSG Doc.	CR	Rev	Cat	Subject/Comment	New version
12/2007	RP-38	RP-070920	-			Approved at TSG-RAN #38 and placed under Change Control	8.0.0
		RP-080163	0001	4		CR to 36.331 with Miscellaneous corrections	8.1.0
		RP-080164	0002	2		CR to 36.331 to convert RRC to agreed ASN.1 format	8.1.0
		RP-080361	0002	1		CR to 36.331 on Miscellaneous clarifications/ corrections	8.2.0
		RP-080693	0005	-		CR on Miscellaneous corrections and clarifications	8.3.0
12/2008	RP-42	RP-081021	0006	-		Miscellaneous corrections and clarifications	8.4.0
		RP-090131	0007	-		Correction to the Counter Check procedure	8.5.0
00,2000		RP-090131	0008	-		CR to 36.331-UE Actions on Receiving SIB11	8.5.0
		RP-090131	0009	1		Spare usage on BCCH	8.5.0
		RP-090131	0010	-		Issues in handling optional IE upon absence in GERAN NCL	8.5.0
	RP-43	RP-090131	0011	-		CR to 36.331 on Removal of useless RLC re-establishment at RB release	8.5.0
		RP-090131	0012	1		Clarification to RRC level padding at PCCH and BCCH	8.5.0
		RP-090131	0013	-		Removal of Inter-RAT message	8.5.0
		RP-090131	0014	-		Padding of the SRB-ID for security input	8.5.0
	RP-43	RP-090131	0015	-	1	Validity of ETWS SIB	8.5.0
		RP-090131	0016	1		Configuration of the Two-Intervals-SPS	8.5.0
	RP-43	RP-090131	0017	-		Corrections on Scaling Factor Values of Qhyst	8.5.0
	RP-43	RP-090131	0018	1		Optionality of srsMaxUppts	8.5.0
	RP-43	RP-090131	0019	-		CR for discussion on field name for common and dedicated IE	8.5.0
	RP-43	RP-090131	0020	-		Corrections to Connected mode mobility	8.5.0
	RP-43	RP-090131	0021	-		Clarification regarding the measurement reporting procedure	8.5.0
		RP-090131	0022	1		Corrections on s-Measure	8.5.0
	RP-43	RP-090131	0023	1		R1 of CR0023 (R2-091029) on combination of SPS and TTI bundling for	8.5.0
						TDD	
		RP-090131	0024	-		L3 filtering for path loss measurements	8.5.0
		RP-090131	0025	1		S-measure handling for reportCGI	8.5.0
		RP-090131	0026	1		Measurement configuration clean up	8.5.0
		RP-090131	0027	-		Alignment of measurement quantities for UTRA	8.5.0
		RP-090131	0028	-		CR to 36.331 on L1 parameters ranges alignment	8.5.0
		RP-090131	0029	-		Default configuration for transmissionMode	8.5.0
		RP-090131	0030	-		CR to 36.331 on RRC Parameters for MAC, RLC and PDCP	8.5.0
		RP-090131	0031	1		CR to 36.331 - Clarification on Configured PRACH Freq Offset	8.5.0
		RP-090131	0032	-		Clarification on TTI bundling configuration	8.5.0
		RP-090131	0033	1		Update of R2-091039 on Inter-RAT UE Capability	8.5.0
		RP-090133	0034	-		Feature Group Support Indicators	8.5.0
		RP-090131	0036	-		Corrections to RLF detection	8.5.0
		RP-090131	0037	-		Indication of Dedicated Priority	8.5.0
		RP-090131	0038	2		Security Clean up	8.5.0
		RP-090131	0039	-		Correction of TTT value range	8.5.0
		RP-090131	0040	-		Correction on CDMA measurement result IE	8.5.0
		RP-090131	0041	1		Clarification of Measurement Reporting	8.5.0
		RP-090131	0042	-		Spare values in DL and UL Bandwidth in MIB and SIB2	8.5.0
			0044	1		Clarifications to System Information Block Type 8	8.5.0
	RP-43	RP-090131	0045	-		Reception of ETWS secondary notification	8.5.0
		RP-090131	0046	1		Validity time for ETWS message Id and Sequence No	8.5.0
		RP-090131	0047	-		CR for Timers and constants values used during handover to E-UTRA	8.5.0
		RP-090131	0048	-		Inter-RAT Security Clarification	8.5.0
		RP-090131	0049	-		CR to 36.331 on consistent naming of 1xRTT identifiers Capturing RRC behavior regarding NAS local release	8.5.0
		RP-090131	0050	-			8.5.0
		RP-090131 RP-090131	0051			Report CGI before T321 expiry and UE null reporting	8.5.0
		RP-090131 RP-090131	0052	-		System Information and 3 hour validity	8.5.0
		RP-090131 RP-090131	0053 0054		<u> </u>	Inter-Node AS Signalling Set of values for the parameter "messagePowerOffsetGroupB"	8.5.0 8.5.0
		RP-090131 RP-090131	0054	E	<u> </u>	CR to paging reception for ETWS capable UEs in RRC_CONNECTED	8.5.0
		RP-090131	0055	-	<u> </u>	CR for CSG related items in 36.331	8.5.0
		RP-090131 RP-090131	0056	1	<u> </u>	SRS common configuration	8.5.0
		RP-090131 RP-090131	0057	Ľ		RRC processing delay	8.5.0
		RP-090131 RP-090131	0058	Ē		CR for HNB Name	8.5.0
		RP-090131	0059	3		Handover to EUTRA delta configuration	8.5.0
		RP-090131	0060	-		Delivery of Message Identifier and Serial Number to upper layers for	8.5.0
	111-45		0000			ETWS	0.0.0
	RP-43	RP-090131	0066	1-		Clarification on the maximum size of cell lists	8.5.0
		RP-090131	0000	1_	<u> </u>	Missing RRC messages in 'Protection of RRC messages'	8.5.0
		RP-090131	0069	1	<u> </u>	Clarification on NAS Security Container	8.5.0
		RP-090131	0009	<u>-</u>	<u> </u>	Extension of range of CQI/PMI configuration index	8.5.0
		RP-090131	0071	1	<u> </u>	Access barring alleviation in RRC connection establishment	8.5.0
		RP-090367	0072	6	<u> </u>	Corrections to feature group support indicators	8.5.0
		RP-090131	0078	-		CR from email discussion to capture DRX and TTT handling	8.5.0
		RP-090131	0079	1	<u> </u>	Need Code handling on BCCH messages	8.5.0
		RP-090131	0080	t <u>i</u>	<u> </u>	Unification of T300 and T301 and removal of miscallaneous FFSs	8.5.0

	RP-43	RP-090131	0084	1	Proposed CR modifying the code-point definitions of	8.5.0
	DD 40	DD 000404	0007	0	neighbourCellConfiguration	0.5.0
		RP-090131	0087	2	Remove Redundant Optionality in SIB8	8.5.0
		RP-090131	0089	-	Corrections to the generic error handling	8.5.0
		RP-090131	0090	-	Configurability of T301	8.5.0
		RP-090131	0091	1	Correction related to TTT	8.5.0
		RP-090131	0095	-	CR for 36.331 on SPS-config	8.5.0
		RP-090131	0096	2	CR for Deactivation of periodical measurement	8.5.0
		RP-090131	0099	2	SMC and reconfiguration	8.5.0
	-	RP-090131	0101	-	TDD handover	8.5.0
		RP-090131	0102	-	Corrections to system information acquisition	8.5.0
	RP-43	RP-090131	0106	-	Some Corrections and Clarifications to 36.331	8.5.0
	RP-43	RP-090131	0109	-	Clarification on the Maximum number of ROHC context sessions	8.5.0
					parameter	
	RP-43	RP-090131	0110	-	Transmission of rrm-Config at Inter-RAT Handover	8.5.0
		RP-090131	0111	1	Use of SameRefSignalsInNeighbor parameter	8.5.0
	RP-43	RP-090131	0112	-	Default serving cell offset for measurement event A3	8.5.0
		RP-090131	0114	-	dl-EARFCN missing in HandoverPreparationInformation	8.5.0
		RP-090131	0115	-	Cleanup of references to 36.101	8.5.0
		RP-090131	0117	-	Correction to the value range of UE-Categories	8.5.0
	-	RP-090131	0122	1	Correction on RRC connection re-establishment	8.5.0
		RP-090131	0122	1		8.5.0
				<u> </u> -	Performing Measurements to report CGI for CDMA2000	
		RP-090131	0125		CDMA2000-SystemTimeInfo in VarMeasurementConfiguration	8.5.0
		RP-090131	0126	-	UE Capability Information for CDMA2000 1xRTT	8.5.0
		RP-090131	0127	-	CDMA2000 related editorial changes	8.5.0
		RP-090131	0128	-	Draft CR to 36.331 on State mismatch recovery at re-establishment	8.5.0
		RP-090131	0129	1	Draft CR to 36.331 on Renaming of AC barring related IEs	8.5.0
	RP-43	RP-090131	0130	2	Draft CR to 36.331 on Inheriting of dedicated priorities at inter-RAT reselection	8.5.0
	RP-43	RP-090131	0135		Proposed CR to 36.331 Description alignment for paging parameter, nB	8.5.0
		RP-090131	0139	2	Miscellaneous corrections and clarifications resulting from ASN.1 review	8.5.0
			0139			
		RP-090131		1	Correction regarding Redirection Information fo GERAN	8.5.0
		RP-090131	0142	-	Further ASN.1 review related issues	8.5.0
		RP-090131	0143	-	Periodic measurements	8.5.0
		RP-090131	0144	1	Further analysis on code point "OFF" for ri-ConfigIndex	8.5.0
	RP-43	RP-090131	0145	1	Adding and deleting same measurement or configuration in one message	8.5.0
	RP-43	RP-090131	0147	-	Corrections to IE dataCodingScheme in SIB11	8.5.0
		RP-090131	0148	-	Clarification on Mobility from E-UTRA	8.5.0
		RP-090131	0149	-	36.331 CR related to "not applicable"	8.5.0
		RP-090131	0150	1	UE radio capability transfer	8.5.0
		RP-090131	0151		CR to 36.331 on value of CDMA band classes	8.5.0
		RP-090131	0152	-	Corrections to DRB modification	8.5.0
		RP-090131	0152	-		
				-	Correction to presence condition for pdcp-config	8.5.0
		RP-090131 RP-090275	0155 0157	-	TDD HARQ-ACK feedback mode Corrections regarding use of carrierFreq for CDMA (SIB8) and GERAN	8.5.0 8.5.0
				↓	(measObject)	
		RP-090321	0156	1	Sending of GERAN SI/PSI information at Inter-RAT Handover	8.5.0
		RP-090339	0158	-	Clarification of CSG support	8.5.0
06/2009		RP-090516	0159	-	Octet alignment of VarShortMAC-Input	8.6.0
		RP-090516	0160	3	Minor corrections to the feature grouping	8.6.0
		RP-090516	0161	I-	Security clarification	8.6.0
		RP-090516	0162	1	Sending of GERAN SI/PSI information at Inter-RAT Handover	8.6.0
				1	Correction of UE measurement model	8.6.0
		RP-090516	1010-1			
		RP-090516 RP-090516	0163	-		860
	RP-44	RP-090516	0164	-	Restricting the reconfiguration of UM RLC SN field size	8.6.0
	RP-44 RP-44	RP-090516 RP-090516	0164 0165	- 1	Restricting the reconfiguration of UM RLC SN field size 36.331 CR on Clarification on cell change order from GERAN to E-UTRAN	8.6.0
	RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516	0164 0165 0166	- 1 -	Restricting the reconfiguration of UM RLC SN field size 36.331 CR on Clarification on cell change order from GERAN to E-UTRAN 36.331 CR - Handling of expired TAT and failed D-SR	8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167	- 1 - 1	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config	8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516	0164 0165 0166	- 1 - 1 2	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS-	8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168		Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections	8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173		Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173 0177	2 - -	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173 0177 0180		Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181	2 - - 2 -	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173 0177 0180	2 - -	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186	2 - - 2 - 1 1	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186 0188	2 - - 2 - 1 1 1	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup         Correction and completion of specification conventions	8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186 0188 0185	2 - - 2 - 1 1 1 2 1 2 2 2 2 2 2 2 2 2 2	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup         Correction and completion of specification conventions         RB combination in feature group indicator	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516 RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186 0188	2 - - 2 - 1 1 1	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup         Correction and completion of specification conventions	8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0           8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186 0188 0185	2 - - 2 - 1 1 1 2 1 2 2 2 2 2 2 2 2 2 2	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup         Correction and completion of specification conventions         RB combination in feature group indicator         CR for need code for fields in mobilityControlInfo	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516           RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186 0188 0195 0196 0197	2 - - 2 - 1 1 1 2 1 2 2 2 2 2 2 2 2 2 2	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup         Correction and completion of specification conventions         RB combination in feature group indicator         CR for need code for fields in mobilityControlInfo         Alignment of pusch-HoppingOffset with 36.211	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
	RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44 RP-44	RP-090516	0164 0165 0166 0167 0168 0173 0177 0180 0181 0182 0186 0188 0195 0196	2 - - 2 - 1 1 1 2 1 2 2 2 2 2 2 2 2 2 2	Restricting the reconfiguration of UM RLC SN field size         36.331 CR on Clarification on cell change order from GERAN to E-UTRAN         36.331 CR - Handling of expired TAT and failed D-SR         Proposed CR to 36.331 Clarification on mandatory information in AS- Config         Miscellaneous small corrections         Clarification on the basis of delta signalling         CR on Alignment of CCCH and DCCH handling of missing mandatory field         Handling of Measurement Context During HO Preparation         Clarification of key-eNodeB-Star in AdditionalReestabInfo         UE Capability Transfer         Clarification regarding mobility from E-UTRA in-between SMC and SRB2/DRB setup         Correction and completion of specification conventions         RB combination in feature group indicator         CR for need code for fields in mobilityControlInfo	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0

		RP-090906	0201	-	Clarification on measurement object configuration for serving frequency	8.7.0
		RP-090906	0202	-	Correction regarding SRVCC	8.7.0
		RP-090906 RP-090906	0203 0204	- 1	Indication of DRB Release during HO Correction regarding application of dedicated resource configuration upon	8.7.0 8.7.0
					handover	
		RP-090906	0205	-	REL-9 protocol extensions in RRC	8.7.0
		RP-090906	0206	-	In-order delivery of NAS PDUs at RRC connection reconfiguration	8.7.0
		RP-090906	0207	-	Correction on Threshold of Measurement Event	8.7.0
		RP-090906 RP-090906	0210	-	Clarification on dedicated resource of RA procedure	8.7.0
	_		0213	1	Cell barring when MasterInformationBlock or SystemInformationBlock1 is missing	8.7.0
		RP-090915	0218	-	Security threat with duplicate detection for ETWS	8.7.0
		RP-090906 RP-090906	0224 0250	-	Clarification on supported handover types in feature grouping Handling of unsupported / non-comprehended frequency band and	8.7.0 8.7.0
	RP-45	RP-090906	0251	-	emission requirement RB combinations in feature group indicator 20	8.7.0
9/2009	RP-45	RP-090934	0220	1	Introduction of Per-QCI radio link failure timers (option 1)	9.0.0
	RP-45	RP-090926	0222	-	Null integrity protection algorithm	9.0.0
		RP-090926	0223	-	Emergency Support Indicator in BCCH	9.0.0
		RP-090934	0230	2	CR to 36.331 for Enhanced CSFB to 1xRTT with concurrent PS handover	9.0.0
		RP-090934	0243	-	REL-9 on Miscellaneous editorial corrections	9.0.0
		RP-090934 RP-090933	0247	-	Periodic CQI/PMI/RI masking	9.0.0
2/2009	-	RP-090933 RP-091346	0252 0253	-	Introduction of CMAS (Rel-9)-clarification on the description of redirectedCarrierInfo	9.0.0
212009	-	RP-091346 RP-091346	0253	1	Adding references to RRC processing delay for inter-RAT mobility	9.1.0
	RP-16	RP-091314	0256	<u> </u>	messages Alignment of srs-Bandwidth with 36.211	9.1.0
		RP-091314 RP-091341	0256	- 5	Baseline CR capturing eMBMS agreements	9.1.0
		RP-091343	0258	3	Capturing agreements on inbound mobility	9.1.0
		RP-091314	0260	-	Clarification of preRegistrationZoneID/secondaryPreRegistrationZoneID	9.1.0
		RP-091346	0261	-	Clarification on NCC for IRAT HO	9.1.0
	RP-46	RP-091314	0263	-	Clarification on P-max	9.1.0
	RP-46	RP-091314	0265	1	Clarification on the definition of maxCellMeas	9.1.0
		RP-091346	0266	-	Correction of q-RxLevMin reference in SIB7	9.1.0
		RP-091346	0267	-	Correction on SPS-Config field descriptions	9.1.0
		RP-091346	0268	1	correction on the definition of CellsTriggeredList	9.1.0
		RP-091345	0269	-	Correction relating to CMAS UE capability	9.1.0
		RP-091314	0271	1	Feature grouping bit for SRVCC handover	9.1.0
		RP-091314	0272	1	Correction and completion of extension guidelines	9.1.0
		RP-091344	0273	-	RACH optimization Stage-3	9.1.0
		RP-091345 RP-091346	0274 0276	-	Stage 3 correction for CMAS SR prohibit mechanism for UL SPS	9.1.0
		RP-091346	0270		Parameters used for enhanced 1xRTT CS fallback	9.1.0
		RP-091346	0277	-	Correction on UTRAN UE Capability transfer	9.1.0
	-	RP-091346	0285	-	Maximum number of CDMA2000 neighbors in SIB8	9.1.0
		RP-091340		1	Introduction of UE Rx-Tx Time Difference measurement	9.1.0
		RP-091346	0297	-	Introduction of SR prohibit timer	9.1.0
		RP-091346	0298	-	Remove FFSs from RAN2 specifications	9.1.0
		RP-091343	0301	1	Renaming Allowed CSG List (36.331 Rel-9)	9.1.0
		RP-091346	0305	-	Re-introduction of message segment discard time	9.1.0
		RP-091346	0306	1	Application of ASN.1 extension guidelines	9.1.0
		RP-091346	0309	1	Support for Dual Radio 1xCSFB	9.1.0
		RP-091346	0311	-	Shorter SR periodicity	9.1.0
		RP-091342	0316	-	CR to 36.331 for Introduction of Dual Layer Transmission	9.1.0
		RP-091343	0318	1	Draft CR to 36.331 on Network ordered SI reporting	9.1.0
		RP-091346	0322	<u> -</u>	UE e1xcsfb capabilities correction	9.1.0
0/00/10		RP-091331	0327	1	Clarification on coding of ETWS related IEs	9.1.0
3/2010		RP-100285	0331		Clarification of CGI reporting	9.2.0
		RP-100305	0332	-	Clarification on MCCH change notification	9.2.0
		RP-100308 RP-100306	0333 0334	<u> -</u>	Clarification on measurement for serving cell only Clarification on proximity indication configuration in handover to E-UTRA	9.2.0
		RP-100306 RP-100308	0334	-	Clarification on proximity indication configuration in handover to E-UTRA Clarification on radio resource configuration in handover to E-UTRA	9.2.0 9.2.0
	RP-47	RP-100308	0336	-	procedure Clarification on UE maximum transmission power	9.2.0
		RP-100308	0337	-	Correction to field descriptions of UE-EUTRA-Capability	9.2.0
		RP-100305	0338	-	Correction to MBMS scheduling terminology	9.2.0
		RP-100308	0339	-	Corrections to SIB8	9.2.0
		RP-100306	0340	-	CR 36.331 R9 for Unifying SI reading for ANR and inbound mobility	9.2.0
		RP-100308	0341	1	CR to 36.331 for 1xRTT pre-registration information in SIB8	9.2.0
		RP-100305	0342	-	CR to 36.331 on corrections for MBMS	9.2.0
		RP-100306	0343	1	CR to 36.331 on CSG identity reporting	9.2.0
		RP-100308	0344	2	CR to 36.331 on Optionality of Rel-9 UE features	9.2.0
		RP-100308	0345	1	CR to 36.331 on Service Specific Acces Control (SSAC)	9.2.0

	DD (7		00.40			
		RP-100308	0346	-	Introduction of power-limited device indication in UE capability.	9.2.0
		RP-100305	0347	-	Missing agreement in MCCH change notification.	9.2.0
		RP-100305	0348	1	Corrections related to MCCH change notification and value ranges	9.2.0
		RP-100306	0349	2	Prohibit timer for proximity indication	9.2.0
		RP-100306 RP-100305	0350	1	Proximity Indication after handover and re-establishment Specifying the exact mapping of notificationIndicator in SIB13 to PDCCH	9.2.0 9.2.0
	KP-47	RP-100305	0351	-	bits	9.2.0
	DD 47	RP-100308	0352	ł - ł	Corrections out of ASN.1 review scope	9.2.0
		RP-100308	0352	-	CR on clarification of system information change	9.2.0
		RP-100308	0358	-	Measurement Result CDMA2000 Cell	9.2.0
		RP-100285	0361	-	Correction on the range of UE Rx-Tx time difference measurement result	9.2.0
		RP-100304	0362	<u> </u> -	Small clarifications regarding MBMS	9.2.0
		RP-100308	0363	<u> </u> -	Introduction of REL-9 indication within field accessStratumRelease	9.2.0
		RP-100306	0364	<u> </u> -		9.2.0
		RP-100308	0365	-	Extending mobility description to cover inbound mobility	9.2.0
		RP-100308	0368	1	Clarification regarding enhanced CSFB to 1XRTT Handling of dedicated RLF timers	9.2.0
				-		
		RP-100305	0370	1	Clarification on UE's behavior of receiving MBMS service	9.2.0
		RP-100305	0371	-	MBMS Service ID and Session ID	9.2.0
		RP-100305	0372	1	Inclusion of non-MBSFN region length in SIB13	9.2.0
		RP-100309	0374	1	CR to 36.331 for e1xCSFB access class barring parameters in SIB8	9.2.0
		RP-100308	0375	-	Multiple 1xRTT/HRPD target cells in MobilityFromEUTRACommand	9.2.0
		RP-100308	0376		Independent support indicators for Dual-Rx CSFB and S102 in SIB8	9.2.0
		RP-100285	0378	-	Clarification on DRX StartOffset for TDD	9.2.0
		RP-100308	0379	1	Miscellaneous corrections from REL-9 ASN.1 review	9.2.0
		RP-100308	0381	-	Need codes and missing conventions	9.2.0
	RP-47	RP-100308	0383	1	Introduction of Full Configuration Handover for handling earlier eNB	9.2.0
		DD 100200	0205		releases Clarification to SFN reference in RRC	0.2.0
		RP-100308 RP-100308	0385	-	RSRP and RSRQ based Thresholds	9.2.0
			0390	-		9.2.0
		RP-100189	0392	3	Redirection enhancements to GERAN	9.2.0
		RP-100308	0398	-	Cell reselection enhancements CR for 36.331	9.2.0
		RP-100307	0401	3	CR on UE-originated RLFreporting for MRO SON use case	9.2.0
		RP-100309	0402	3	CR to 36.331 on Redirection enhancements to UTRAN	9.2.0
		RP-100306	0403	2	Proximity status indication handling at mobility	9.2.0
		RP-100305	0404	-	Upper layer aspect of MBSFN area id	9.2.0
		RP-100308	0405	-	Redirection for enhanced 1xRTT CS fallback with concurrent PSHO	9.2.0
		RP-100301	0406	-	Avoiding interleaving transmission of CMAS notifications	9.2.0
		RP-100308	0407	1	Introduction of UE GERAN DTM capability indicator	9.2.0
		RP-100381	0408	2	Introducing provisions for late ASN.1 corrections	9.2.0
		RP-100245	0411	-	Correction/ alignment of REL-9 UE capability signalling	9.2.0
06/2010		RP-100553	0412	-	Clarification for mapping between warning message and CB-data	9.3.0
	-	RP-100556	0413	-	Clarification of radio link failure related actions	9.3.0
		RP-100554	0414	-	Clarification on UE actions upon leaving RRC_CONNECTED	9.3.0
	-	RP-100553	0415	-	Correction on CMAS system information	9.3.0
	RP-48	RP-100554	0416	1	Corrections to MBMS	9.3.0
		RP-100536		-	Decoding of unknown future extensions	9.3.0
		RP-100556	0419	1	Miscellaneous small corrections and clarifications	9.3.0
		RP-100551	0420		Prohibit timer for proximity indication	9.3.0
		RP-100556	0421	-	RLF report for MRO correction	9.3.0
		RP-100546	0423	1	Missing UTRA bands in IRAT-ParametersUTRA-FDD	9.3.0
		RP-100556	0424	-	Correction on handling of dedicated RLF timers	9.3.0
		RP-100556	0431	1	Protection of RRC messages	9.3.0
		RP-100556	0433	-	Handling missing Essential system information	9.3.0
		RP-100551	0434	1	Clarification on UMTS CSG detected cell reporting in LTE	9.3.0
		RP-100556	0436	-	Introducing provisions for late corrections	9.3.0
00/00:5		RP-100556	0437	-	Clarification regarding / alignment of REL-9 UE capabilities	9.3.0
09/2010		RP-100845	0440	-	Correction to 3GPP2 reference for interworking with cdma2000 1x	9.4.0
	RP-49	RP-100851	0441	-	Clarification on UL handover preparation transfer	9.4.0
		RP-100851	0442	1	Clarifications regarding fullConfiguration	9.4.0
	RP-49	RP-100851 RP-100851	0443	-	Clarifications regarding handover to E-UTRAN	9.4.0
	RP-49 RP-49	RP-100851 RP-100851 RP-100854	0443 0444	1 - -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features	9.4.0 9.4.0
	RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100851	0443 0444 0445	1 - - -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE	9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100851 RP-100853	0443 0444 0445 0446	1 - - 2	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs	9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100851 RP-100853 RP-100851	0443 0444 0445 0446 0447	1 - - 2 -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100851 RP-100853 RP-100851 RP-100851	0443 0444 0445 0446 0447 0448	1 	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100851 RP-100853 RP-100851 RP-100851	0443 0444 0445 0446 0447 0448 0452	1 - - 2 - - - -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100851 RP-100853 RP-100851 RP-100851 RP-100851 RP-100845	0443 0444 0445 0446 0447 0448 0452 0456	1 - - 2 - - - - -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE Description of multi-user MIMO functionality in feature group indicator table	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100853 RP-100853 RP-100851 RP-100851 RP-100845 RP-100845	0443 0444 0445 0446 0447 0448 0452 0456 0458	1 - - 2 - - - - - - - -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE Description of multi-user MIMO functionality in feature group indicator table Correct the PEMAX_H to PEMAX	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100853 RP-100851 RP-100851 RP-100851 RP-100845 RP-100845 RP-100851	0443 0444 0445 0446 0447 0448 0452 0456 0458 0460	1 - - 2 - - - - - - - - - - -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE Description of multi-user MIMO functionality in feature group indicator table Correct the PEMAX_H to PEMAX Clarification for feature group indicator bit 11	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851 RP-100851 RP-100854 RP-100853 RP-100853 RP-100851 RP-100851 RP-100845 RP-100845	0443 0444 0445 0446 0447 0448 0452 0456 0458	1 - - 2 - - - - - - - - - - - 1	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE Description of multi-user MIMO functionality in feature group indicator table Correct the PEMAX_H to PEMAX Clarification for feature group indicator bit 11 Clarification of FGI setting for inter-RAT features not supported by the UE	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100851           RP-100851           RP-100854           RP-100853           RP-100853           RP-100851           RP-100851           RP-100851           RP-100851           RP-100851           RP-100851           RP-100851           RP-100851           RP-100845           RP-100851           RP-100851           RP-100851           RP-100851           RP-100851	0443 0444 0445 0446 0447 0448 0452 0456 0456 0458 0460 0465 0475	1 - - 2 - - - - - - - - 1 1	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE Description of multi-user MIMO functionality in feature group indicator table Correct the PEMAX_H to PEMAX Clarification for feature group indicator bit 11 Clarification of FGI setting for inter-RAT features not supported by the UE FGI settings in Rel-9	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0
12/2010	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-50	RP-100851 RP-100851 RP-100854 RP-100853 RP-100851 RP-100851 RP-100851 RP-100845 RP-100845 RP-100851 RP-100851	0443 0444 0445 0446 0447 0448 0452 0456 0458 0460 0465	1       -       -       2       -       -       -       -       -       -       1       -	Clarifications regarding handover to E-UTRAN Correction on the table of conditionally mandatory Release 9 features Corrections to TS36.331 on MeasConfig IE CR to 36.331 on clarification for MBMS PTM RBs Introduction of late corrections container for E-UTRA UE capabilities Renaming of containers for late non-critical extensions Clarifications Regarding Redirection from LTE Description of multi-user MIMO functionality in feature group indicator table Correct the PEMAX_H to PEMAX Clarification for feature group indicator bit 11 Clarification of FGI setting for inter-RAT features not supported by the UE	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0

		RP-101210	0486	1	Corrections to the presence of IE regarding DRX and CQI	9.5.0
		RP-101210	0493	-	The field descriptions of MeasObjectEUTRA	9.5.0
		RP-101197	0498	1	Clarification of FGI settings non ANR periodical measurement reporting	9.5.0
	<b>RP-50</b>	RP-101209	0500	-	Corrections to RLF Report	9.5.0
		RP-101206	0519	1	T321 timer fix	9.5.0
		RP-101197	0524	-	Restriction of AC barring parameter setting	9.5.0
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	RP-50	RP-101197	0526	1	Clarification regarding default configuration value N/A	9.5.0
		RP-101431	0532	-	Splitting FGI bit 3	9.5.0
	RP-50	RP-101183	0476	4	36.331 CR on Introduction of Minimization of Drive Tests	10.0.0
	RP-50	RP-101293	0477	4	AC-Barring for Mobile Originating CSFB call	10.0.0
	RP-50	RP-101214	0478	-	Addition of UE-EUTRA-Capability descriptions	10.0.0
	RP-50	RP-101214	0481	-	Clarification on Default Configuration for CQI-ReportConfig	10.0.0
	RP-50	RP-101215	0487	-	CR to 36.331 adding e1xCSFB support for dual Rx/Tx UE	10.0.0
	RP-50	RP-101227	0488	1	Introduction of Carrier Aggregation and UL/ DL MIMO	10.0.0
	RP-50	RP-101228	0489	1	Introduction of relays in RRC	10.0.0
		RP-101214	0490	1	Priority indication for CSFB with re-direction	10.0.0
		RP-101214	0491	1-	SIB Size Limitations	10.0.0
		RP-101214	0513	-	Combined Quantity Report for IRAT measurement of UTRAN	10.0.0
		RP-101214	0527	1	UE power saving and Local release	10.0.0
		RP-101429	0530	1	Inclusion of new UE categories in Rel-10	10.0.0
03/2011		RP-110282	0533		36331_CRxxx_Protection of Logged Measurements Configuration	10.0.0
00/2011		RP-110202	0534	1	Stage-3 CR for MBMS enhancement	10.1.0
		RP-110282	0535		Clean up MDT-related text	10.1.0
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		RP-110282	0539	-	CR to 36.331 on corrections for MDT	10.1.0
		RP-110202	0543	-	Introduction of CA/MIMO capability signalling and measurement capability	10.1.0
	111-51	111-110230	0343		signalling in CA	10.1.0
	DD 51	RP-110282	0544		MDT PDU related clarifications	10.1.0
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		RP-110280		1	Miscellaneous small clarifications and corrections	10.1.0
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		RP-110282	0549	1	Memory size for logged measurements capable UE	10.1.0
		RP-110289	0550	-	Parameters confusion of non-CA and CA configurations	10.1.0
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		RP-110280	0557	1	Some Corrections on measurement	10.1.0
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		RP-110291	0559	-	Support of Integrity Protection for Relay	10.1.0
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		RP-110291		1	Note for Dedicated SIB for RNs	10.1.0
		RP-110272	0579	-	Correction to cs-fallbackIndicator field description	10.1.0
		RP-110289	0580	-	Clarification to the default configuration of sCellDeactivationTimer	10.1.0
		RP-110289	0581	-	Miscellaneous corrections to TS 36.331 on Carrier Aggregation	10.1.0
		RP-110280	0584	-	Correction of configuration description in SIB2	10.1.0
		RP-110265	0587	-	Clarification of band indicator in handover from E-UTRAN to GERAN	10.1.0
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	RP-51	RP-110292	0590	-	Update of R2-110807 on CSI measurement resource restriction for time	10.1.0
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	RP-51	RP-110292	0591	-	Update of R2-110821 on RRM/RLM resource restriction for time domain	10.1.0
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		RP-110290	0592	-	Corrections on UE capability related parameters	10.1.0
		RP-110282	0596	-	Validity time for location information in Immediate MDT	10.1.0
		RP-110280	0597	-	CR to 36.331 adding UE capability indicator for dual Rx/Tx e1xCSFB	10.1.0
		RP-110289	0598	-	Miscellaneous corrections to CA	10.1.0
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		RP-110280	0600	-	Correction to the reference of ETWS	10.1.0
		RP-110269	0602	1	Introduction of OTDOA inter-freq RSTD measurement indication procedure	
	RP-51	RP-110280	0603	-	Correction of use of RRCConnectionReestablishment message for	10.1.0
					contention resolution	
	RP-51	RP-110282	0604	-	CR to 36.331 on MDT neighbour cell measurements logging	10.1.0
		RP-110272	0609	-	Minor ASN.1 corrections for the UEInformationResponse message	10.1.0
		RP-110280	0613	-	Clarification regarding dedicated RLF timers and constants	10.1.0
		RP-110282	0615	-	Release of Logged Measurement Configuration	10.1.0
			0616	t <u>.</u>	Some corrections on TS 36.331	10.1.0
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	RP-51	RP-110280 RP-110280 RP-110282	0623	-	AC barring procedure clean up Counter proposal to R2-110826 on UE capabilities for MDT	10.1.0 10.1.0

	RP-51	RP-110289	0629	2	Measurement on the deactivated SCells	10.1.0
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		RP-110280	0638	-	Correction on the range of CQI resource index	10.1.0
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	RP-51	RP-110280	0643	1	Corrections to TS36.331 on SIB2 handling	10.1.0
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		RP-110289	0646	1	Clarification for CA and TTI bundling in RRC	10.1.0
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06/2011		RP-110836	0651	-	Add MBMS counting procedure to processing delay requirement for RRC procedure clause 11.2	10.2.0
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		RP-110847	0654	1	Addition of a specific reference for physical configuration fields	10.2.0
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		RP-110830	0658	-	Clarification of optionality of UE features without capability	10.2.0
		RP-110839	0660	-	Clarification on the definition of maxCellBlack	10.2.0
		RP-110839	0661	-	Clarification on upper layer requested connection release	10.2.0
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		RP-110839	0663	-	CR for s-measure handling	10.2.0
		RP-110851	0664	1	CR on clarification of RLF Report in Carrier Aggregation	10.2.0
		RP-110830	0669	-	FGI bit for handover between LTE FDD/TDD	10.2.0
		RP-110847	0670	2	Further updates on L1 parameters	10.2.0
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	RP-52	RP-110843	0673	-	Introduction of TCE ID for logged MDT	10.2.0
		RP-110670	0674	4	Miscellaneous corrections (related to review in preparation for ASN.1 freeze)	10.2.0
	RP-52	RP-110843	0675	-	PLMN check for MDT logging	10.2.0
		RP-110839	0677	-	UE actions upon leaving RRC_CONNECTED	10.2.0
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		RP-110828	0693	1	Correction for SR-VCC and QCI usage	10.2.0
		RP-110847	0694	-	Restructuring of CQI-ReportConfig-r10	10.2.0
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		RP-110834	0704	-	Corrections to the handling of ri-ConfigIndex for TM9	10.2.0
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	RP-52	RP-110839	0713	1- 1	CR to 36.331 on redirected utra-TDD carrier frequency	10.2.0
		RP-110839	0714	-	Explicit AS signalling for mapped PTMSI/GUTI	10.2.0
		RP-110847	0718	1-	Counter proposal for Updates of mandatory information in AS-Config	10.2.0
		RP-110839	0719	-	CR for Reconfiguration of discardTimer in PDCP-Config	10.2.0
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		RP-110830	0735	1- 1-	Radio frame alignment of CSA and MSP	10.2.0
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	RP-52	RP-110839	0744	-	Counter proposal to R2-112753 on CR to remove CSG Identity validity limited to CSG cell	10.2.0
	RP-52	RP-110839	0746	1	Increase of prioritisedBitRate	10.2.0
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	RP-53 RP-53 RP-53 RP-53 RP-53	RP-111297 RP-111283 RP-111280 RP-111283 RP-111297	0773 0775 0784 0792 0793	- 2 - - -	Clarifications to P-max on CA Clarification on for which subframes signalling MCS applies Corrections in RRC Replace the tables with exception list in 10.5 AS-Config	10.3.0 10.3.0 10.3.0
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	RP-54	RP-111706	0823	1	36.331 CR SPS reconfiguration	10.4.0
	RP-54	RP-111716	0827	2	Clarification of list sizes in measurement configuration stored by UE	10.4.0
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		RP-111714	0840	1	Clarification on MBSFN and measurement resource restrictions	10.4.0
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00/2012	RP-55	RP-120321	0857	-	CR to 36.331 on cdma2000 band classes and references	10.5.0
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		RP-120325	0871	-	On SIB10/11 Reception Timing	10.5.0
		RP-120326	0875	1	Clarification on MBMS counting for uncipherable services	10.5.0
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	<b>RP-55</b>	RP-120326	0894	-	Time to keep RLF Reporting logs	10.5.0
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	RP-55	RP-120321	0899	-	xDD UE Clarification on SRB2 resumption upon connection re-establishment	10.5.0
		RP-120321	0900	1	(parallel message transmission) Duplicated ASN.1 naming correction	10.5.0
06/2012		RP-120321 RP-120805	0900		SPS Reconfiguration	10.5.0
00/2012		RP-120805	0903	1	Change in Scheduling Information for ETWS	10.6.0
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		RP-120808	0916	1	Change in Scheduling Information for CMAS	10.6.0
		RP-120804	0919	1	Introducing means to signal different REL-10 FDD/TDD Capabilities/FGIs	10.6.0
	RP-56	RP-120812	0920	1	for Dual-xDD UE Clarification on setting of dedicated NS value for CA by E-UTRAN	10.6.0
	RP-56	RP-120808	0931	-	T321 value for UTRA SI acquisition	10.6.0
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	RP-56	RP-120812	0969	1	Introduction of supported bandwidth combinations for CA	10.6.0
	RP-56	RP-120734	0970	1	Introduction of multiple frequency band indicator	10.6.0
	RP-56	RP-120825	0934	-	Introduction of a new security algorithm ZUC	11.0.0
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		RP-121423	1000	4	36.331 CR introducing In-Device Coexistence (IDC)	11.1.0
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	RP-58	RP-121940 RP-121940 RP-121957 RP-121957 RP-121958 RP-121954	1072 1073 1074 1075 1076 1077	2 -	CR to 36.331 on SIB15 acquisition Handling of 1xCSFB failure Miscellaneous corrections RAN overload control using RRC connection Rejection RRC support for CoMP in UL	11.2.0 11.2.0 11.2.0 11.2.0 11.2.0
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	RP-58           RP-58	RP-121940 RP-121940 RP-121957 RP-121957 RP-121958 RP-121954	1072 1073 1074 1075 1076 1077	2 -	CR to 36.331 on SIB15 acquisition Handling of 1xCSFB failure Miscellaneous corrections RAN overload control using RRC connection Rejection RRC support for CoMP in UL	11.2.0 11.2.0 11.2.0 11.2.0 11.2.0

	RP-58	RP-121959	1093	1	CR to 36.331 on introducing ROHC context continue for intra-ENB handover	11.2.0
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		RP-121947	1120	-	CR to 36.331 on additional information in RLF report for inter-RAT MRO	11.2.0
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		RP-130227	1235	1	Correcting further UE aspects regarding multi band cells	11.3.0
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06/2015	RP-67 RP-67 RP-68 RP-68 RP-68 RP-68	RP-150377 RP-150374 RP-150921 RP-150921 RP-150921	1768 1770 1800 1801 1802		Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0
06/2015	RP-67 RP-68 RP-68 RP-68 RP-68 RP-68	RP-150377 RP-150374 RP-150921 RP-150921 RP-150921 RP-150920	1768 1770 1800 1801 1802 1804		Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0
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06/2015	RP-67           RP-68	RP-150377 RP-150374 RP-150921 RP-150921 RP-150920 RP-150920 RP-150921 RP-150921 RP-150921 RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817		Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS CR on Aperiodic CSI Reporting for 1.4MHz cell Clarification on PDCP reconfiguration Correction to SCG change Minor corrections for PSCell configuration in DC	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-68	RP-150377 RP-150374 RP-150921 RP-150921 RP-150920 RP-150920 RP-150921 RP-150921 RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816		Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921           RP-150921           RP-150920           RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818		Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS CR on Aperiodic CSI Reporting for 1.4MHz cell Clarification on PDCP reconfiguration Correction to SCG change Minor corrections for PSCell configuration in DC CR on ROHC for split bearer	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
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6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921           RP-150921           RP-150920           RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921           RP-150921           RP-150920           RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1819 1803 1810 1811	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1819 1803 1810 1811 1813	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1818 1819 1803 1810 1811 1813 1814	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1819 1803 1810 1811 1813 1814 1806	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission         Correction on field description on SL-TF-ResourceConfig         Mandatory present of supportedMIMO-CapabilityDL-r10	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-68	RP-150377           RP-150374           RP-150921           RP-150923	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission         Correction on field description on SL-TF-ResourceConfig         Mandatory present of supportedMIMO-CapabilityDL-r10         Clarification on Cell barring for downlink only bands	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
6/2015	RP-67           RP-67           RP-68	RP-150377           RP-150374           RP-150921           RP-150923           RP-150917	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission         Correction on field description on SL-TF-ResourceConfig         Mandatory present of supportedMIMO-CapabilityDL-r10         Clarification on Cell barring for downlink only bands         Clarification on Gell barring for downlink only bands	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-67           RP-68           RP-68 </td <td>RP-150377           RP-150374           RP-150921           RP-150923           RP-150917           RP-150917</td> <td>1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852 1827</td> <td>2 - - - - - - - - - - - - -</td> <td>Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS CR on Aperiodic CSI Reporting for 1.4MHz cell Clarification on PDCP reconfiguration Correction to SCG change Minor corrections for PSCell configuration in DC CR on ROHC for split bearer Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD CA Correction to SCG and split bearer configuration Clarifications on use of preconfigComm for direct communication Miscellaneous corrections (a.o. Sidelink) Conditions for establishing RRC Connection for sidelink transmission Correction on field description on SL-TF-ResourceConfig Mandatory present of supportedMIMO-CapabilityDL-r10 Clarification on Cell barring for downlink only bands Clarification regarding no MBMS sessions ongoing Correction to additionalSpectrumEmission</td> <td>12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0</td>	RP-150377           RP-150374           RP-150921           RP-150923           RP-150917           RP-150917	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852 1827	2 - - - - - - - - - - - - -	Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS CR on Aperiodic CSI Reporting for 1.4MHz cell Clarification on PDCP reconfiguration Correction to SCG change Minor corrections for PSCell configuration in DC CR on ROHC for split bearer Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD CA Correction to SCG and split bearer configuration Clarifications on use of preconfigComm for direct communication Miscellaneous corrections (a.o. Sidelink) Conditions for establishing RRC Connection for sidelink transmission Correction on field description on SL-TF-ResourceConfig Mandatory present of supportedMIMO-CapabilityDL-r10 Clarification on Cell barring for downlink only bands Clarification regarding no MBMS sessions ongoing Correction to additionalSpectrumEmission	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-67           RP-68           RP-68 </td <td>RP-150377           RP-150374           RP-150921           RP-150923           RP-150923           RP-150923           RP-150923</td> <td>1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852 1827 1820</td> <td>2 - - - - - - - - - - - - -</td> <td>Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission         Correction on field description on SL-TF-ResourceConfig         Mandatory present of supportedMIMO-CapabilityDL-r10         Clarification on Cell barring for downlink only bands         Clarification regarding no MBMS sessions ongoing         Correction to additionalSpectrumEmission         Clarification on extended RSRQ range support</td> <td>12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0</td>	RP-150377           RP-150374           RP-150921           RP-150923           RP-150923           RP-150923           RP-150923	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852 1827 1820	2 - - - - - - - - - - - - -	Introduction of ProSe         Correction field description of networkControlledSyncTx         Clarification on SCG reconfiguration         Correction for aperiodic CSI trigger         Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED         Reconfiguration of SPS         CR on Aperiodic CSI Reporting for 1.4MHz cell         Clarification on PDCP reconfiguration         Correction to SCG change         Minor corrections for PSCell configuration in DC         CR on ROHC for split bearer         Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD         CA         Correction to SCG and split bearer configuration         Clarifications on use of preconfigComm for direct communication         Miscellaneous corrections (a.o. Sidelink)         Conditions for establishing RRC Connection for sidelink transmission         Correction on field description on SL-TF-ResourceConfig         Mandatory present of supportedMIMO-CapabilityDL-r10         Clarification on Cell barring for downlink only bands         Clarification regarding no MBMS sessions ongoing         Correction to additionalSpectrumEmission         Clarification on extended RSRQ range support	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0
)6/2015	RP-67           RP-67           RP-68           RP-68 </td <td>RP-150377           RP-150374           RP-150921           RP-150923           RP-150917           RP-150917</td> <td>1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852 1827</td> <td>2 - - - - - - - - - - - - -</td> <td>Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS CR on Aperiodic CSI Reporting for 1.4MHz cell Clarification on PDCP reconfiguration Correction to SCG change Minor corrections for PSCell configuration in DC CR on ROHC for split bearer Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD CA Correction to SCG and split bearer configuration Clarifications on use of preconfigComm for direct communication Miscellaneous corrections (a.o. Sidelink) Conditions for establishing RRC Connection for sidelink transmission Correction on field description on SL-TF-ResourceConfig Mandatory present of supportedMIMO-CapabilityDL-r10 Clarification on Cell barring for downlink only bands Clarification regarding no MBMS sessions ongoing Correction to additionalSpectrumEmission</td> <td>12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0</td>	RP-150377           RP-150374           RP-150921           RP-150923           RP-150917           RP-150917	1768 1770 1800 1801 1802 1804 1805 1809 1815 1816 1817 1818 1817 1818 1819 1803 1810 1811 1813 1814 1806 1853 1852 1827	2 - - - - - - - - - - - - -	Introduction of ProSe Correction field description of networkControlledSyncTx Clarification on SCG reconfiguration Correction for aperiodic CSI trigger Correction on handling of wlan-OffloadConfigDedicated upon leaving RRC_CONNECTED Reconfiguration of SPS CR on Aperiodic CSI Reporting for 1.4MHz cell Clarification on PDCP reconfiguration Correction to SCG change Minor corrections for PSCell configuration in DC CR on ROHC for split bearer Clarification on FDD/TDD differentiation of FGIs/capabilities in TDD-FDD CA Correction to SCG and split bearer configuration Clarifications on use of preconfigComm for direct communication Miscellaneous corrections (a.o. Sidelink) Conditions for establishing RRC Connection for sidelink transmission Correction on field description on SL-TF-ResourceConfig Mandatory present of supportedMIMO-CapabilityDL-r10 Clarification on Cell barring for downlink only bands Clarification regarding no MBMS sessions ongoing Correction to additionalSpectrumEmission	12.5.0 12.5.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0 12.6.0

	RP-68	RP-150923	1824	-	Clean-up corrections to TS 36.331	12.6.0
	RP-68	RP-150918	1846	1	Correction to IDC signalling	12.6.0
		RP-150921	1822	1	Change of LCID upon DC-specific DRB reconfiguration	12.6.0
		RP-150921	1832	1	Correction to PHR format	12.6.0
		RP-150921	1842	1	Correction on conditions for sidelink operation	12.6.0
00/0045		RP-150811	1834	2	Correction on the SL-TF-IndexPair values for ProSe Direct Discovery	12.6.0
09/2015		RP-151443	1866	-	Correction on UE band combinition capability	12.7.0
		RP-151438 RP-151443	1869 1884	-	Correction on Restriction to CA capability signalling The support of UL64QAM	12.7.0 12.7.0
		RP-151443 RP-151442	1889	-	Small corrections concerning RadioResourceConfig	12.7.0
		RP-151442	1900	-	Sidelink discovery related corrections	12.7.0
		RP-151440	1905	2	Clarification of Beacon RSSI Encoding	12.7.0
		RP-151439	1911	1	CR for IDC signalling enhancement for UL CA	12.7.0
		RP-151440	1880	2	Clarification on cell selection sequence upon leaving RRC_CONNECTED	12.7.0
	RP-69	RP-151438	1908	-	Correction to additionalSpectrumEmission - Option 1	12.7.0
		RP-151439	1879	1	Correction on the reference of EPDCCH	12.7.0
	RP-69	RP-151441	1891	1	Introducing general handling and guidelines concerning critical extensions within a release	12.7.0
	RP-69	RP-151443	1909	1	Applicability of longCodeState1XRTT for 1xRTT IRAT ANR	12.7.0
		RP-151441	1912	1	Sidelink terminology alignment in TS 36.331	12.7.0
		RP-151442	1906	2	Clarification for NAICS capability signalling	12.7.0
		RP-151467	1861	2	Additional MIMO/CSI capability for intra-band contiguous CA	12.7.0
		RP-151466	1887	2	Signalling for 4-layer MIMO with TM3 and TM4	12.7.0
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12/2015		RP-152053	1916	-	Correction on SCG release	12.8.0
		RP-152053	1932		Clarification to SCG RLF timers and constants reconfiguration	12.8.0
		RP-152053 RP-152053	1933 1946		Correction to triggerQuantityCSI-RS Correction to NAICS field descriptions	12.8.0 12.8.0
		RP-152055	1940	-	Correction of need code definition terminology	12.8.0
		RP-152050	1964	-	Clarification on FDD/TDD difference for UL CA IDC indication	12.8.0
		RP-152046	1975	-	Correction to SystemTimeInfoCDMA2000 IE	12.8.0
		RP-152053	1928	1	highPriorityAccess for MMTEL voice, MMTEL video and SMS	12.8.0
		RP-152053	1986	1	Correction to the support of Mobility State reporting	12.8.0
		RP-152046	1971	1	MaxLayerMIMO in HandoverPreparationInformation	12.8.0
	RP-70	RP-152046	1987	-	Correction to ASN.1 field names for 4-layer TM3/4	12.8.0
	RP-70	RP-152053	1969	1	Correction on measurement identity autonomous removal in dual connectivity	12.8.0
		RP-152053	1979	1	Clarification on tdd-FDD-CA-PCellDuplex	12.8.0
		RP-152049	1919	2	Alternative new maximum transport block sizes for DL 64QAM and 256QAM in TM9/10	12.8.0
		RP-152050	1934	1	Some general RRC issues	12.8.0
		RP-152055	1965	1	Correction on capability rsrq-OnAllSymbols	12.8.0
		RP-152056	1931	2	Addition of establishment cause for mobile-originating VoLTE calls and network indication in SIB2	12.8.0
			1927	2	CR to correct UE messages to be sent only after security activation	12.8.0
		RP-152053		3	Clarification of MCG	12.8.0
40/0045			1923	4	Enabling multiple NS and P-Max operation per cell	12.8.0
12/2015		RP-152084	1917	-	MCCH acquisition for 1.4MHz MBSFN	13.0.0
		RP-152084 RP-152084	1937 1972		Paging optimization White-list of cells for EUTRA measurement reporting	13.0.0 13.0.0
		RP-152064 RP-152074	1972	1	Intdroduction of Dual Connectivity enhancements in Rel-13	13.0.0
		RP-152078	1983	2	Introduction of Licensed-Assisted Access using LTE	13.0.0
		RP-152075	1952	1	Extension of Frequency Priorities	13.0.0
		RP-152075	1949	1	Introduction of RS-SINR measurements using non critical extension	13.0.0
	RP-70	RP-152079	1961	2	Introducing EBF FD MIMO parameters	13.0.0
	RP-70	RP-152081	1935	1	Removing SCG change restrictions regarding upon handover	13.0.0
	RP-70	RP-152066	1984	1	Introduction of Application specific Congestion control for Data Communication in LTE	13.0.0
		RP-152071	1872	6	36331 CR for capturing B5C and SCell on PUCCH	13.0.0
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	RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73	RP-161758 RP-161758 RP-161758 RP-161751 RP-161759 RP-161759 RP-161758 RP-161754	2263 2266 2268 2269 2270 2272 2272	3 - 2 1 1	Cleanup of the NB-IoT ASN.1         Miscellaneous corrections to clause 4 and 5 for NB-IoT         Clarification to intra-band contiguous CA capabilities         Clarification on RRC processing delay for CloT         Supporting new UE Rx – Tx time difference mapping table         Alignment of procedure when handling up-CloT-EPS-Optimisation         Simplification of UE capability reporting procedure	13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0
	RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73	RP-161758 RP-161758 RP-161758 RP-161751 RP-161759 RP-161759 RP-161758 RP-161754 RP-161752	2263 2266 2268 2269 2270 2272 2273 2273	3 - 2 1	Cleanup of the NB-IoT ASN.1         Miscellaneous corrections to clause 4 and 5 for NB-IoT         Clarification to intra-band contiguous CA capabilities         Clarification on RRC processing delay for CloT         Supporting new UE Rx – Tx time difference mapping table         Alignment of procedure when handling up-CloT-EPS-Optimisation         Simplification of UE capability reporting procedure         Corrections on system information acquisition for Sidelink discovery	13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0
	RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73	RP-161758 RP-161758 RP-161758 RP-161751 RP-161759 RP-161759 RP-161758 RP-161754 RP-161752 RP-161756	2263 2266 2268 2269 2270 2272 2273 2274 2275	3 - 2 1 1	Cleanup of the NB-IoT ASN.1         Miscellaneous corrections to clause 4 and 5 for NB-IoT         Clarification to intra-band contiguous CA capabilities         Clarification on RRC processing delay for CloT         Supporting new UE Rx – Tx time difference mapping table         Alignment of procedure when handling up-CloT-EPS-Optimisation         Simplification of UE capability reporting procedure         Corrections on system information acquisition for Sidelink discovery         Small corrections regarding (WLAN) measurement reporting	13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0         13.3.0
	RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73 RP-73	RP-161758 RP-161758 RP-161758 RP-161751 RP-161759 RP-161759 RP-161758 RP-161754 RP-161752	2263 2266 2268 2269 2270 2272 2273 2273	3 - 2 1 1 2 2	Cleanup of the NB-IoT ASN.1         Miscellaneous corrections to clause 4 and 5 for NB-IoT         Clarification to intra-band contiguous CA capabilities         Clarification on RRC processing delay for CloT         Supporting new UE Rx – Tx time difference mapping table         Alignment of procedure when handling up-CloT-EPS-Optimisation         Simplification of UE capability reporting procedure         Corrections on system information acquisition for Sidelink discovery	13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0 13.3.0

RP-73         RP-161762           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161755           RP-73 <td< th=""><th></th><th></th><th>Correction on SRB addition and modification</th><th>13.3.0</th></td<>			Correction on SRB addition and modification	13.3.0
RP-73         RP-161762           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73 <td< td=""><td>2282</td><td>1</td><td>Clarifications on RCLWI</td><td>13.3.0</td></td<>	2282	1	Clarifications on RCLWI	13.3.0
RP-73         RP-161762           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161755           RP-73 <td< td=""><td>2283</td><td>1</td><td>Introduction of DelayTolerantAccess establishment cause in NB-IoT</td><td>13.3.0</td></td<>	2283	1	Introduction of DelayTolerantAccess establishment cause in NB-IoT	13.3.0
RP-73         RP-161755           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161755           RP-73 <td< td=""><td>2284</td><td>1</td><td>Maximum number of simultaneous UL PDCP delay measurements for FeMDT</td><td>13.3.0</td></td<>	2284	1	Maximum number of simultaneous UL PDCP delay measurements for FeMDT	13.3.0
RP-73         RP-161755           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161755           RP-73 <td< td=""><td>2287</td><td>2</td><td>Clarification on DRX cycle used by the UE</td><td>13.3.0</td></td<>	2287	2	Clarification on DRX cycle used by the UE	13.3.0
RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-74 <td< td=""><td>2288</td><td>1</td><td>Invalidation of stored system information in connected mode</td><td>13.3.0</td></td<>	2288	1	Invalidation of stored system information in connected mode	13.3.0
RP-73         RP-161749           RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-74 <td< td=""><td>2289</td><td>1</td><td>Clarification on bit mapping of fdd-DownlinkOrTddSubframeBitmapLC and fdd-UplinkSubframeBitmapLC</td><td>13.3.0</td></td<>	2289	1	Clarification on bit mapping of fdd-DownlinkOrTddSubframeBitmapLC and fdd-UplinkSubframeBitmapLC	13.3.0
RP-73         RP-161759           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-74 <td< td=""><td>2290</td><td>-</td><td>Correction on C-IoT optimizations for non-NB-IoT UE</td><td>13.3.0</td></td<>	2290	-	Correction on C-IoT optimizations for non-NB-IoT UE	13.3.0
RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-74 <td< td=""><td>2295</td><td>1</td><td>Clarification on timer handling for zero value</td><td>13.3.0</td></td<>	2295	1	Clarification on timer handling for zero value	13.3.0
RP-73         RP-161749           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161765           RP-73         RP-161761           RP-73         RP-161755           RP-74 <td< td=""><td>2299</td><td>-</td><td>Measurement configuration during RRC resume in CIoT</td><td>13.3.0</td></td<>	2299	-	Measurement configuration during RRC resume in CIoT	13.3.0
RP-73         RP-161755           RP-73         RP-161753           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161765           RP-73         RP-161765           RP-73         RP-161765           RP-73         RP-161761           RP-73         RP-161765           RP-73         RP-161761           RP-73         RP-161755           RP-74 <td< td=""><td>2301</td><td>1</td><td>Correction on UEPagingCoverageInformation</td><td>13.3.0</td></td<>	2301	1	Correction on UEPagingCoverageInformation	13.3.0
RP-73         RP-161753           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161760           RP-73         RP-161765           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-73 <td< td=""><td>2305</td><td>1</td><td>DRB re-setup in Full Configuration</td><td>13.3.0</td></td<>	2305	1	DRB re-setup in Full Configuration	13.3.0
RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-74 <td< td=""><td>2306</td><td>1</td><td>Rel-13 correction for eMTC parameter values</td><td>13.3.0</td></td<>	2306	1	Rel-13 correction for eMTC parameter values	13.3.0
RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161755           RP-74 <td< td=""><td>2307</td><td>1</td><td>CR on forwarding LAA measurement results for DC Clarification on associationTimer</td><td>13.3.0</td></td<>	2307	1	CR on forwarding LAA measurement results for DC Clarification on associationTimer	13.3.0
RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161755           RP-74         RP-161755           RP-74 <td< td=""><td>2309 2310</td><td>1</td><td>Clarification on PDCP-Config and statusFeedback for LWA</td><td>13.3.0 13.3.0</td></td<>	2309 2310	1	Clarification on PDCP-Config and statusFeedback for LWA	13.3.0 13.3.0
RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161754           RP-73         RP-161755           RP-74         RP-161755           RP-74 <td< td=""><td>2310</td><td>-</td><td>Order of addition and removal of WLAN-Identifiers</td><td>13.3.0</td></td<>	2310	-	Order of addition and removal of WLAN-Identifiers	13.3.0
RP-73         RP-161755           RP-73         RP-161753           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161765           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161754           RP-73         RP-161755           RP-74         RP-161755           RP-74 <td< td=""><td>2313</td><td>-</td><td>Multiple WLAN measurement objects on the same frequency</td><td>13.3.0</td></td<>	2313	-	Multiple WLAN measurement objects on the same frequency	13.3.0
RP-73         RP-161753           RP-73         RP-161760           RP-73         RP-161765           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161757           RP-73         RP-161757           RP-73         RP-161757           RP-73         RP-161758           RP-73         RP-161757           RP-73         RP-161758           RP-73         RP-161757           RP-73         RP-161758           RP-73         RP-161757           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           RP-74         RP-161758           RP-74         RP-162318           RP-74         RP-162318           RP-74 <td< td=""><td>2315</td><td>-</td><td>Correction about eMTC frequency hopping parameters</td><td>13.3.0</td></td<>	2315	-	Correction about eMTC frequency hopping parameters	13.3.0
RP-73         RP-161760           RP-73         RP-161755           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161757           RP-73         RP-161757           RP-73         RP-161757           RP-73         RP-161757           RP-73         RP-161757           RP-73         RP-161758           RP-74         RP-161758           RP-74         RP-162318           RP-74         RP-162318           RP-74 <td< td=""><td>2317</td><td>1</td><td>Handling of tdd-Config-r10 for LAA Scell</td><td>13.3.0</td></td<>	2317	1	Handling of tdd-Config-r10 for LAA Scell	13.3.0
RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161761           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161757           RP-73         RP-161758           RP-74         RP-161758           RP-74         RP-161758           RP-74         RP-162318           RP-74         RP-162317           RP-74 <td< td=""><td>2318</td><td>1</td><td>Introduction of 1.2Gbps and 1.6Gbps UE categories in Rel-13</td><td>13.3.0</td></td<>	2318	1	Introduction of 1.2Gbps and 1.6Gbps UE categories in Rel-13	13.3.0
RP-73         RP-161761           RP-73         RP-161827           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161754           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161757           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161758           RP-73         RP-161758           9/2016         RP-73           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-16231	2320	2	Extended T310 timer values for eMTC	13.3.0
RP-73         RP-161827           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           9/2016         RP-73           RP-73         RP-161755           RP-73         RP-161755           9/2016         RP-73           RP-73         RP-161746           RP-73         RP-161745           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-16	2323	1	Introducing UE capability of Rel 13 CCH IM	13.3.0
RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161754           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           PP-73         RP-161758           P/2016         RP-73           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           P/2016         RP-74           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-16231	2324	1	Introducing UE capability of CRS-IM for TM 1-9	13.3.0
RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161754           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161758           P9/2016         RP-73           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-1623	2325	2	Continuous uplink transmission in eMTC	13.3.0
RP-73         RP-161758           RP-73         RP-161754           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           P0/2016         RP-73           RP-73         RP-161745           RP-73         RP-161745           RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162313           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         R	2328	1	Correction on PUSCH repetition numbers for CE Mode A	13.3.0
RP-73         RP-161754           RP-73         RP-161756           RP-73         RP-161756           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           P9/2016         RP-73           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-74         RP-162178           RP-74         RP-162313           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162311           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         R	2329 2334	2	Frequency hopping configuration for paging Reservation of RA resources in NB-IoT	13.3.0 13.3.0
RP-73         RP-161756           RP-73         RP-161762           RP-73         RP-161755           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74 <td< td=""><td>2336</td><td>1</td><td>Extended PHR corrections</td><td>13.3.0</td></td<>	2336	1	Extended PHR corrections	13.3.0
RP-73         RP-161762           RP-73         RP-161755           RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161746           RP-73         RP-161745           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162311           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-16	2337	1	Corrections for LWA/LWIP	13.3.0
RP-73         RP-161755           RP-73         RP-161758           RP-73         RP-161758           RP-73         RP-161751           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161758           9/2016         RP-73           RP-73         RP-161746           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-16	2338	3	Correction on 12/16-port CSI-RS resource configuration for FD-MIMO	13.3.0
RP-73         RP-161751           RP-73         RP-161758           9/2016         RP-73         RP-161746           RP-73         RP-161745           RP-74         RP-162318           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162313           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317 <t< td=""><td>2339</td><td>2</td><td>Corrections in Rel-13 eMTC SI acquisition</td><td>13.3.0</td></t<>	2339	2	Corrections in Rel-13 eMTC SI acquisition	13.3.0
RP-73         RP-161758           9/2016         RP-73         RP-161746           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161747           2/2016         RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314     <	2342	-	Correction of downlink gap applicability for NB-IoT	13.3.0
9/2016         RP-73         RP-161746           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161745           RP-73         RP-161747           2/2016         RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314     <	2344	1	Indication of the maxLayersMIMO	13.3.0
RP-73         RP-161745           RP-73         RP-161747           2/2016         RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314 <t< td=""><td>2346</td><td>-</td><td>nrs-Power signaling for NB-IoT non-anchor carrier</td><td>13.3.0</td></t<>	2346	-	nrs-Power signaling for NB-IoT non-anchor carrier	13.3.0
RP-73         RP-161747           2/2016         RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162313           RP-74         RP-162314           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314 <t< td=""><td>2261 2340</td><td>1</td><td>Introducing V2V to TS 36.331</td><td>14.0.0</td></t<>	2261 2340	1	Introducing V2V to TS 36.331	14.0.0
2/2016         RP-74         RP-162318           RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314 <t< td=""><td>2340</td><td>-</td><td>Introduction of enhanced LAA for LTE Introduction of L2 Latency reduction techniques</td><td>14.0.0</td></t<>	2340	-	Introduction of enhanced LAA for LTE Introduction of L2 Latency reduction techniques	14.0.0
RP-74         RP-162313           RP-74         RP-162316           RP-74         RP-162327           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74 <td< td=""><td>2362</td><td>-</td><td>Clarification on the RRC connection resume procedure</td><td>14.1.0</td></td<>	2362	-	Clarification on the RRC connection resume procedure	14.1.0
RP-74         RP-162316           RP-74         RP-162327           RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74 <td< td=""><td>2364</td><td>1</td><td>Clarification on AS-Config</td><td>14.1.0</td></td<>	2364	1	Clarification on AS-Config	14.1.0
RP-74         RP-162318           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162311           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162314           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162316	2366	1	Corrections to LWA release	14.1.0
RP-74         RP-162317           RP-74         RP-162321           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162318           RP-74         RP-162312           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162316	2373	1	Signalling of LWIP aggregation	14.1.0
RP-74         RP-162321           RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162314           RP-74         RP-162318           RP-74         RP-162312           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74 <td< td=""><td>2375</td><td>1</td><td>Miscellaneous corrections to TS 36.331</td><td>14.1.0</td></td<>	2375	1	Miscellaneous corrections to TS 36.331	14.1.0
RP-74         RP-162311           RP-74         RP-162316           RP-74         RP-162314           RP-74         RP-162318           RP-74         RP-162312           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162318           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162316	2377	-	Clarification on valid value range of codebookConfigNx fields	14.1.0
RP-74         RP-162316           RP-74         RP-162314           RP-74         RP-162318           RP-74         RP-162312           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162316           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162316	2378	-	Miscellaneous corrections to eLAA	14.1.0
RP-74         RP-162314           RP-74         RP-162318           RP-74         RP-162312           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2381 2386	-	FDD&TDD diff for mbms-AsyncDC Corrections to WLAN status monitoring	14.1.0
RP-74         RP-162318           RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162315	2389	-	Clarification to the security mode command procedure for NB-IoT	14.1.0
RP-74         RP-162312           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162315           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162313	2391	-	Clarification on UE power class 2 indication	14.1.0
RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162328           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162313	2394	-	Correction on UE behavior in Paging procedure	14.1.0
RP-74         RP-162314           RP-74         RP-162315           RP-74         RP-162328           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162313	2396	-	Corrections to NB-IoT SystemInformationBlockType2 handling	14.1.0
RP-74         RP-162328           RP-74         RP-162314           RP-74         RP-162327           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162313	2398	1	Data available for transmission	14.1.0
RP-74         RP-162314           RP-74         RP-162327           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162313	2400	1	Correction on Downlink power allocation for SC-PTM	14.1.0
RP-74         RP-162327           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2402	-	Corrections on V2V in TS 36.331	14.1.0
RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2403		Correction on field description of up/cp-CIoT-EPS-Optimisation	14.1.0
RP-74         RP-162317           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2404 2407		Extension of PollByte	14.1.0
RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2407	<u> -</u>	Clarification on Rel-13 CCH-IM UE capability Configuration of DMTC for neighbour and serving cells in LAA carrier	14.1.0
RP-74         RP-162314           RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313			frequency	
RP-74         RP-162314           RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2413 2415		Clarification on uplink carrier frequency NB-IoT RRC Processing Delays	14.1.0
RP-74         RP-162317           RP-74         RP-162316           RP-74         RP-162313	2415	$\frac{1}{1}$	Correction of connection suspension related aspects	14.1.0
RP-74 RP-162316 RP-74 RP-162313	2420	-	Clarification regarding on CSI-RS resource configuration for FD-MIMO	14.1.0
RP-74 RP-162313	2424	-	Clearing of measurements upon reporting WLAN unavailability	14.1.0
RP-74 RP-162309	2428	-	Minor changes regarding UE category	14.1.0
	2435	1	Correction of NOTE 3 in UE-EUTRA-Capability related to multiple CA- MIMO-ParametersDL/UL	14.1.0
	2441	1	Clarification on reporting of the plmn-IdentityList	14.1.0
	2446	2	Correction on SSTD Measurement Reporting	14.1.0
	2448 2451	1	Introduce Enhancements for High Speed in 36.331 System information update for eDRX UEs	14.1.0

RP-74	RP-162317	2453	1	Correction on ACDC handling	14.1.0
RP-74	RP-162328	2457	1	Correction and Clarification to TS 36.331	14.1.0
RP-74	RP-162313	2459	1	Correction to frequecy hopping configuration	14.1.0
RP-74	RP-162314	2461	-	Correction to non-anchor carrier configuration	14.1.0
RP-74	RP-162329	2462	1	UE capabilities for Latency Reduction	14.1.0
RP-74	RP-162311	2466	1	Conrrections on sidelink pre-configurations and default configurations	14.1.0
RP-74	RP-162317	2469	-	Minor corrections for Rel-13 eD2D	14.1.0
RP-74	RP-162324	2471	3	Introduction of SRS switching for LTE	14.1.0
RP-74	RP-162325	2473	1	Introduction of MUST	14.1.0
RP-74	RP-162314	2474	-	Clarification on system information acquisition for NB-IoT	14.1.0
RP-74	RP-162314	2476	-	Editorial correction for NB-IoT	14.1.0
RP-74	RP-162314	2478	-	Acknowledgement delay of RRCConnectionRelease message in NB-IoT	14.1.0
RP-74	RP-162320	2484	-	Introduction of new UL category in Rel-13	14.1.0
RP-74	RP-162327	2485	-	Addition of eCall over IMS Indication in SIB1	14.1.0
RP-74	RP-162313	2488	-	DMRS scrambling sequence initialization parameter for MPDCCH	14.1.0
RP-74	RP-162313	2490	-	RSRP threshold when only CE level 0 is used	14.1.0
RP-74	RP-162313	2492	-	Correction on fdd-DownlinkOrTddSubframeBitmapBR	14.1.0
RP-74	RP-162313	2495	-	Correction to presence of uplink frequency hopping interval parameter	14.1.0
RP-74	RP-162315	2497	1	Correction to SC-PTM scheduling period start offset	14.1.0
RP-74	RP-162316	2504	-	Correction to WLAN measurement configuration	14.1.0
RP-74	RP-162328	2509	1	Introducing Shorter Resource Reservation Periodicities for V2X	14.1.0
RP-74	RP-162313	2519	1	Acknowledgement delay of RRCConnectionRelease message for eMTC UEs	14.1.0
RP-74	RP-162314	2525	-	Correction on channel bandwidth definition for NB-IoT	14.1.0
RP-74	RP-162316	2534	1	Clarifications on empty WLAN identifiers	14.1.0
RP-74	RP-162316	2542	1	Clarifications on empty WLAN identifiers in Mobility Set for RCLWI	14.1.0
RP-74	RP-162350	2546	-	timeInfoUTC in SIB16	14.1.0
RP-74	RP-162313	2547	-	Clarification on fdd-DownlinkOrTddSubframeBitmapBR	14.1.0
RP-74	RP-162321	2548	2	Introduction of capabilities for eLAA	14.1.0
RP-74	RP-162309	2552	-	Clarification on prioritization of multiple Pmax values	14.1.0
RP-74	RP-162329	2553	-	CR on RV setting with UL skipping	14.1.0
RP-74	RP-162314	2555	1	Correction of default physical channel configuration for NB-IoT	14.1.0

	RP-170639	2559	2	А	Signalling of 1Rx UE category	14.2.0
RP-75	RP-170636	2560	1	В	Introducing Rel-14 FeMTC into RRC	14.2.0
	RP-170643	2563	1	F	Correction on V2X sidelink communication in TS 36.331	14.2.0
	RP-170668	2565	1	В	Introduction of a new special subframe configuration	14.2.0
	RP-170652	2576	1	A	Providing SIB1-BR via dedicated RRC signalling	14.2.0
	RP-170641	2577	1	В	Introduction of eDECOR	14.2.0
	RP-170636	2578 2580	1	B B	Introduction of SC-PTM for feMTC and NB-IoT enhancements	14.2.0
	RP-170629 RP-170657	2580	1	A	Introducing RRC parameters for eFD-MIMO (REL-14) Indication of S1-U data transfer	14.2.0 14.2.0
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ļ		RP-171920	3063	1	A	Clarification on number of RACH CE levels vs number of RSRP thresholds	14.4.0
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		RP-180448	3245	2	A	Introduction of LTE DL 1.4Gbps Category	15.1.0
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		RP-180441	3296	2	A	Clarification on the NPRACH starting subcarrier partitioning for multi-tone Msg3 transmission	15.1.0
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		RP-180444	3301	1	А	Correction on SI-offsetIndicator for the sidelink resource pool	15.1.0
		RP-180441	3306	-	Α	RRC Corrections for RRC Resume	15.1.0
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		RP-181235	3307	3	A	Small correction on PhysicalConfigDedicated-NB	15.2.0
		RP-181234	3312	2	A	Correction on SPS assistance information in TS 36.331	15.2.0
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		RP-181230	3357	2	А	Correction for IDC hardware sharing problems	15.2.0
	RP-80	RP-181234	3360	2	А	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration	15.2.0
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	RP-80 RP-80	RP-181234	3360	2	А	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration	15.2.0
	RP-80 RP-80 RP-80	RP-181234 RP-181236	3360 3365	2 3	A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections	15.2.0 15.2.0
	RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231	3360 3365 3370	2 3 1	A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable	15.2.0 15.2.0 15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181216 RP-181229	3360 3365 3370 3386 3394	2 3 1 3	A A F F	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs	15.2.0 15.2.0 15.2.0 15.2.0 15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181216 RP-181229 RP-181236	3360 3365 3370 3386 3394 3396	2 3 1 3 1 1	A A F F A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices	15.2.0 15.2.0 15.2.0 15.2.0 15.2.0 15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181216 RP-181229 RP-181236 RP-181233	3360 3365 3370 3386 3394 3396 3399	2 3 1 3	A A F F	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release	15.2.0 15.2.0 15.2.0 15.2.0 15.2.0 15.2.0 15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181216 RP-181229 RP-181236 RP-181233 RP-181233	3360         3365         3370         3386         3394         3396         3399         3426	2 3 1 3 1 1 1 -	A A F A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release Clarification on RRC reconfiguration without handover for switching EC to NC	15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181216 RP-181229 RP-181233 RP-181233 RP-181233 RP-181233	3360 3365 3370 3386 3394 3396 3399 3426 3427	2 3 1 3 1 1 1 -	A A F A A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release Clarification on RRC reconfiguration without handover for switching EC to NC Correction on extended RSRP measurement reporting for BL UE or UE in CE	15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181231 RP-181229 RP-181233 RP-181233 RP-181233 RP-181233 RP-181233	3360 3365 3370 3386 3394 3396 3399 3426 3427 3427	2 3 1 3 1 1 1 -	A A F A A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release Clarification on RRC reconfiguration without handover for switching EC to NC Correction on extended RSRP measurement reporting for BL UE or UE in CE	15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181231 RP-181229 RP-181233 RP-181233 RP-181233 RP-181233 RP-181233 RP-181232 RP-181232	3360 3365 3370 3386 3394 3399 3426 3427 3427 3430 3433	2 3 1 3 1 1 - - 1 - -	A A F A A A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release Clarification on RRC reconfiguration without handover for switching EC to NC Correction on extended RSRP measurement reporting for BL UE or UE in CE Correction to handling of p-Max procedure for high-power UEs Clarification on cellIdentity for shortMAC-I	15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0
	RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80 RP-80	RP-181234 RP-181236 RP-181231 RP-181231 RP-181229 RP-181233 RP-181233 RP-181233 RP-181233 RP-181233 RP-181232 RP-181236 RP-181236	3360 3365 3370 3386 3394 3399 3426 3427 3427 3430 3433 3439	2 3 1 3 1 1 1 -	A A F A A A A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release Clarification on RRC reconfiguration without handover for switching EC to NC Correction on extended RSRP measurement reporting for BL UE or UE in CE Correction to handling of p-Max procedure for high-power UEs Clarification on cellIdentity for shortMAC-I Introduction of DL Channel Quality reporting	15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0
	RP-80           RP-80	RP-181234 RP-181236 RP-181231 RP-181231 RP-181229 RP-181233 RP-181233 RP-181233 RP-181233 RP-181233 RP-181232 RP-181232	3360 3365 3370 3386 3394 3399 3426 3427 3427 3430 3433	2 3 1 3 1 1 - - 1 - -	A A F A A A A A	Correction for IDC hardware sharing problems Corrections to syncOffsetIndicator Configuration Correction on UE capabilities Clarification on ue-TxAntennaSelectionSupported when bandParameterList-v1380 is included Miscellaneous EN-DC related corrections Handling of Pmax for PC2 and uplink intra-band contiguous CA capable UEs Correction for support of alternative TBS indices Clarification on RACH-less configuration release Clarification on RRC reconfiguration without handover for switching EC to NC Correction on extended RSRP measurement reporting for BL UE or UE in CE Correction to handling of p-Max procedure for high-power UEs Clarification on cellIdentity for shortMAC-I	15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0         15.2.0

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	RP-182679	3739	1	F	Correction of field descriptions for NW based CRS interference mitigation	15.4.0
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-	RP-182666	3741	4	F	Alternative signalling option for SupportedBandListNR	15.4.0
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# History

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