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Evolved Universal Terrestrial Radio Access (E-UTRA);
User Equipment (UE) conformance specification;
Radio transmission and reception;
Part 3: Radio Resource Management (RRM) conformance testing
(3GPP TS 36.521-3 version 9.4.0 Release 9)

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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
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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:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

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.

Introduction

The present document is part 3 of a multi-parts TS:

3GPP TS 36.521-1 [10]: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception; Part 1: Conformance Testing.

3GPP TS 36.521-2 [23]: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception; Part 2: Implementation Conformance Statement (ICS).

3GPP TS 36.521-3: Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification Radio transmission and reception; Part 3: Radio Resource Management (RRM) conformance testing.

1 Scope

The present document specifies the measurement procedures for the conformance test of the user equipment (UE) that contain requirements for support of RRM (Radio Resource Management) as part of the 3G Long Term Evolution (3G LTE).

The requirements are listed in different clauses only if the corresponding parameters deviate. More generally, tests are only applicable to those mobiles that are intended to support the appropriate functionality. To indicate the circumstances in which tests apply, this is noted in the "*test applicability*" part of the test.

For example only Release 8 and later UE declared to support LTE shall be tested for this functionality. In the event that for some tests different conditions apply for different releases, this is indicated within the text of the test itself.

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] 3GPP TS 36.101: "E-UTRA UE radio transmission and reception".

[3] ITU-R Recommendation SM.329-10, "Unwanted emissions in the spurious domain".

[4] 3GPP TS 36.133: "E-UTRA requirements for support of radio resource management".

[5] 3GPP TS 36.331: "E-UTRA Radio Resource Control (RRC): protocol specification".

[6] 3GPP TS 36.304: "E-UTRA UE procedures in idle mode".

[7] 3GPP TS 36.508: "Common test environments for User Equipment (UE)".

[8] 3GPP TS 36.213: "E-UTRA Physical layer procedures".

[9] 3GPP TS 36.211: "E-UTRA Physical Channels and Modulation".

[10] 3GPP TS 36.521-1: "User Equipment (UE) conformance specification Radio transmission and reception. Part 1: Conformance Testing".

[11] 3GPP TS 36.321: "E-UTRA Medium Access Control (MAC): protocol specification".

[12] 3GPP TS 36.214: "E-UTRA Physical layer - Measurements".

[13] 3GPP TS 45.010: "Radio subsystem synchronization".

[14] 3GPP TS 36.306: "E-UTRA UE radio access capabilities".

[15] 3GPP TS 45.008: "Radio subsystem link control".

[16] 3GPP TS 45.005: "Radio transmission and reception"

[17] 3GPP2 C.S0033-B: "Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Terminal".

[18] 3GPP2 C.S0024-B: “cdma2000 High Rate Packet Data Air Interface Specification”.

[19] 3GPP2 C.S0011-C: “Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations”..

[20] 3GPP TR 36.903: "Derivation of test tolerances for Radio Resource Management (RRM) conformance tests ".

[21] 3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".

[22] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".

[23] 3GPP TS 36.521-2: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 2: Implementation Conformance Statement (ICS)".

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].

Channel edge: The lowest and highest frequency of the carrier, separated by the channel bandwidth.

Channel bandwidth: The RF bandwidth supporting a single E-UTRA RF carrier with the transmission bandwidth configured in the uplink or downlink of a cell. The channel bandwidth is measured in MHz and is used as a reference for transmitter and receiver RF requirements.

Maximum throughput: The maximum achievable throughput for a reference measurement channel.

Maximum Output Power: The mean power level per carrier of UE measured at the antenna connector in a specified reference condition.

Mean power: When applied to E-UTRA transmission this is the power measured in the operating system bandwidth of the carrier. The period of measurement shall be at least one subframe (1ms) unless otherwise stated.

Occupied bandwidth: The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage β/2 of the total mean power of a given emission.

Output power: The mean power of one carrier of the UE, delivered to a load with resistance equal to the nominal load impedance of the transmitter.

Throughput: The number of payload bits successfully received per second for a reference measurement channel in a specified reference condition.

Transmission bandwidth: Bandwidth of an instantaneous transmission from a UE or BS, measured in Resource Block units.

Transmission bandwidth configuration: The highest transmission bandwidth allowed for uplink or downlink in a given channel bandwidth, measured in Resource Block units.

3.2 Symbols

For the purposes of the present document, the following symbols apply:

$BW_{Channel}$	Channel bandwidth, defined in TS 36.101 subclause 3.2
CPICH_Ec	Average energy per PN chip for the CPICH
CPICH_Ec/Io	The ratio of the received energy per PN chip for the CPICH to the total received power spectral density at the UE antenna connector.
Ec	Average energy per PN chip

Ês	Received energy per RE (power normalized to the subcarrier spacing) during the useful part of the symbol, i.e. excluding the cyclic prefix, at the UE antenna connector
Io	The total received power density, including signal and interference, as measured at the UE antenna connector.
Ioc	The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.
Iot	The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector
N_{oc}	The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as measured at the UE antenna connector
n_{PRB}	Physical Resource Block number as defined in subclause 3.1 in 3GPP TS 36.211.
P_{CMAX}	Configured UE transmitted power as defined in subclause 6.2.5 in 3GPP TS 36.101.
S	Defined in TS 36.304, subclause 5.2.3.2 for E-UTRAN
SCH_Ec/Ior	The ratio of the transmit energy per PN chip of the SCH to the total transmit power spectral density at the UTRA Node B antenna connector
SCH_RP	Received (linear) average power of the resource elements that carry E-UTRA synchronisation signal, measured at the UE antenna connector
$S_{\text{ServingCcell}}$	Defined in TS 36.304
Sintersearch	Defined in TS 25.304, subclause 5.2.6.1.5
Sintrasearch	Defined in TS 25.304, subclause 5.2.6.1.5 for UTRAN and in TS 36.304, subclause 5.2.4.7 for E-UTRAN
Snonintrasearch	Defined in TS 36.304, subclause 5.2.4.7
SsearchRAT	Defined in TS 25.304, subclause 5.2.6.1.5
$\text{Thresh}_{\text{x, high}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Thresh}_{\text{x, low}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Thresh}_{\text{serving, low}}$	Defined in TS 36.304, subclause 5.2.4.7
$T_{\text{RE-ESTABLISH-REQ}}$	The RRC Re-establishment delay requirement, the time between the moment when erroneous CRCs are applied, to when the UE starts to send preambles on the PRACH.
Treselection	Defined in TS 25.304, subclause 5.2.6.1.5
$\text{Treselection}_{\text{RAT}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Treselection}_{\text{EUTRAN}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Treselection}_{\text{UTRAN}}$	Defined in TS 36.304, subclause 5.2.4.7
$\text{Treselection}_{\text{GERAN}}$	Defined in TS 36.304, subclause 5.2.4.7
T_S	Basic time unit, defined in TS 36.211, clause 4

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] 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].

1x RTT	CDMA2000 1x Radio Transmission Technology
ARQ	Automatic Repeat Request
AWGN	Additive White Gaussian Noise
BCCH	Broadcast Control Channel
BCH	Broadcast Channel
BS	Base Station
BSIC	Base transceiver Station Identity Code
CCCH SDU	Common Control Channel SDU
CCTrCH	Coded Composite Transport Channel
CFN	Connection Frame Number
CPICH	Common Pilot Channel
CPICH Ec/No	CPICH received energy per chip divided by the power density in the band
C-RNTI	Cell RNTI

CQI	Channel Quality Indicator
DL	Downlink
DCCH	Dedicated Control Channel
DPCH	Dedicated Physical Channel
DPCCH	Dedicated Physical Control Channel
DRX	Discontinuous Reception
DTX	Discontinuous Transmission
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
EPRE	Energy Per Resource Element
E-UTRA	Evolved UMTS Terrestrial Radio Access
E-UTRAN	Evolved UMTS Terrestrial Radio Access Network
FDD	Frequency Division Duplex
FRC	Fixed Reference Channel
GSM	Global System for Mobile communication
HARQ	Hybrid Automatic Repeat Request
HO	Handover
HRPD	High Rate Packet Data
MAC	Medium Access Control
OCNG	OFDMA Channel Noise Generator
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal Frequency Division Multiple Access
PBCH	Physical Broadcast Channel
PCCH	Paging Control Channel
P-CCPCH	Primary Common Control Physical Channel
PCFICH	Physical Control Format Indicator Channel
PDCCH	Physical Downlink Control Channel
PDSCH	Physical Downlink Shared Channel
PHICH	Physical Hybrid ARQ Indictor Channel
PLMN	Public Land Mobile Network
PMI	Precoding Matrix Indicator
PRACH	Physical Random Access Channel
PUCCH	Physical Uplink Control Channel
PUSCH	Physical Uplink Shared Channel
RACH	Random Access Channel
RAT	Radio Access Channel
REFSENS	Reference Sensitivity power level
r.m.s	Root Mean Square
RNC	Radio Network Controller
RNTI	Radio Network Temporary Identifier
RRC	Radio Resource Control
RRM	Radio Resource Management
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
RSSI	Received Signal Strength Indicator
SCH	Synchronization Channel
SDU	Service Data Unit
SFN	System Frame Number
SNR	Signal-to-Noise Ratio
SON	Self Organizing Network
SRS	Sounding Reference Signal
TDD	Time Division Duplex
TTI	Transmission Time Interval
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network

3A Requirements for support of RRM

3A.1 General

Radio Resource Management (RRM) ensures the efficient use of the available radio resources and also provides mechanisms that enable E-UTRAN to meet radio resource related requirements. The requirements that are tested include:

- Idle mode, the cell re-selection algorithms that are controlled by the setting of parameters (thresholds and hysteresis values) that define the best cell and/or determine when the UE should select a new cell
- The configuration of the UE measurement and reporting procedures that are transmitted via dedicated signalling in connected mode
- Connected mode, the mobility of radio connections that has to be supported
- Handover decisions that may be based on UE or eNB measurements
- Inter-RAT RRM, the management of radio resources in connection with inter-RAT mobility, e.g. Inter-RAT handover

Inter frequency and inter-RAT test cases are performed without frequency overlapping between cells required in the test. For bands with bandwidth not accommodating all the cells required in the test without frequency overlapping, inter band testing shall be done according subclause 3A.3.4. If the UE does not support the combination given in subclause 3A.3.4, the relevant tests are applicable only to the bands with the necessary bandwidth.

For test cases in clauses 4, 5, 6, 7, 8, 9 the initial conditions of the downlink physical channels signal levels and downlink physical channels required are specified in Annex C.0.

Unless otherwise mentioned, in those test case where delay is the test criteria, if HARQ or even RLC retransmission happens and is detected by SS, the extra delay due to retransmission shall be excluded in the delay calculation before making a pass or fail judgement on the UE in the test.

3A.2 Requirements Classification for Statistical Testing

The test requirements are expressed as absolute requirements with a single value stating the requirement or expressed as a success rate. The statistical nature depends on the type of test requirement. Some have large statistical variations, while others are not statistical in nature at all. When testing a parameter with a statistical nature, a confidence level is set. This establishes the probability that a Device Under Test (DUT) passing the test actually meets the test requirement and determines how many times a test have to be repeated and what the pass and fail criteria is. The statistical significance shall be set according to Annex G.

3A.3 RRM Test Configurations

The cell configuration of cells described in the test cases shall be set according to TS 36.508 [7] section 4.4.7.

3A.3.1 UE with Single Antenna Connector

For testing a UE with a single E-UTRA antenna connector, the connection diagram configurations are described in TS 36.508 [7] Annex A.

3A.3.2 UE with Multiple Antenna Connectors

For testing a UE with more than one E-UTRA antenna connector, the connection diagram configurations are described in TS 36.508 [7] Annex A. For UEs with more than one E-UTRA antenna connector the fading of the signals and the AWGN signals applied to each receiver antenna connector shall be uncorrelated. The levels of the test signal applied to each of the antenna connectors shall be as defined in the respective test cases.

3A.3.3 UE with Multiband Capability

The Radio Resource Management performance of a UE in sections 4 – 8 is considered to be independent from all bands. Therefore, the required performance in the respective test cases can be verified in one of the bands supported by the UE, with the exception of inter-band testing requirements in clause 3A.1. The test cases in section 9 are considered to be band dependant and are therefore applicable in all of the supported bands in the UE.

3A.3.4 Operating band configuration

Inter-band configuration is not affecting the test purpose since the minimum requirements are valid regardless of band. Band combinations defined in table 3A.3.4-1 shall be used for testing.

Table 3A.3.4-1: Inter-band configuration

Band under test	Additional band
5	4
11	1
12	4
13	4
14	4
17	4
18	1
19	1
21	1
Note 1: The band under test should contain the inter-frequency (neighbour) cell. Note 2: The additional band should contain the serving cell of the test. If more than one inter-frequency cell is needed, that cell should be on the additional band. Note 3: For inter-RAT tests, the E-UTRAN cell is on the additional band, and the non-E-UTRAN cell is on the band under test. Note 4: Bands 5 and 11 only need inter-band configuration in test cases where 3 cells are required	

4 E-UTRAN RRC_IDLE State Mobility

After the UE has switched on and a PLMN has been selected, the cell selection process takes place. This process allows the UE to select a suitable cell where to camp on in order to access available services. In this process the UE can use stored information (*Stored information cell selection*) or not (*Initial cell selection*).

When the UE is in either Camped Normally state or Camped on Any Cell state on a cell, the UE attempts to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated by the serving cell, the cell re-selection evaluation process takes place. This process allows the UE to select a more suitable cell and camp on it. In this process the UE measurement activity is controlled by measurement rules defined in TS 36.304 [6] clause 5.2.4.2, allowing the UE to limit its measurement activity.

4.1 E-UTRAN Cell Selection

Editor's note: There are currently no tests defined for E-UTRAN cell selection.

4.2 E-UTRAN Cell Re-Selection

4.2.1 E-UTRAN FDD - FDD cell re-selection intra frequency case

4.2.1.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

4.2.1.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate\ E\text{-}UTRAN\_Intra}$ + $T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,\ EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurement of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}$ / 2.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluateFDD,Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for re-selection, the side conditions are RSRP and SCh apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of Treselection is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the Treselection timer.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI\text{-}EUTRA}$ + 50 ms. $T_{SI\text{-}EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Intra-frequency carrier

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS

36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells), cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.1.

4.2.1.4 Test description

4.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Messagecontents are as defined in clause 4.2.1.4.3
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA FDD carrier. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the

UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.
2. Set the parameters according to T1 in Table 4.2.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.
4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.1.5-1.
5. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.
6. If the UE responds on the newly detectable cell, Cell 2 during time duration T2 within 34 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
7. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.1.5-1.
8. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.
9. If the UE responds on the already detected cell, Cell 1 during time duration T3 within 8 seconds from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
10. When T3 expires, repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.2.1.5 Test requirement

Tables 4.2.1.4.1-1 and 4.2.1.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency cell re-selection test case.

Table 4.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA Note 1							
OCNG_RB Note 1							
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
$Qhyst_s$	dB	0	0	0	0	0	0
$Qoffset_{s,n}$	dB	0	0	0	0	0	0
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
$\hat{E}_s/I_{ot}$	dB	16.00	-3.55	3.24	-infinity	3.24	-3.55
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	16.00	13.00	16.45	-infinity	16.45	13.00
RSRP Note 3	dBm/15 kHz	-82.00	-85.00	-81. 55	-infinity	-81. 55	-85.00
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The cell re-selection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,E\text{-}UTRAN\_Intra} + T_{SI\text{-}EUTRA}$

$T_{detect,E\text{-}UTRAN\_Intra}$ = 32 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI\text{-}EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.3

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 seconds but the test allows 34 seconds).

The cell re-selection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E\text{-}UTRAN\_Intra}$ + $T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Intra}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI\text{-}EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.3

The cell re-selection delay to an already detected cell shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.2.2 E-UTRAN TDD - TDD cell re-selection intra frequency case

4.2.2.1 Test purpose

To verify that when the current and target cell operates on the same carrier frequency the UE is able to search and measure cells to meet the intra-frequency cell re-selection requirements.

4.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

4.2.2.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E\text{-}UTRAN\_Intra}$ + $T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new intra-frequency cells and perform RSRP measurement of identified intra-frequency cells without an explicit intra-frequency neighbour list containing physical layer cell identities.

The UE shall be able to evaluate whether a newly detectable intra-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $T_{detect,EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0.

The UE shall measure RSRP at least every $T_{measure,EUTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 for intra-frequency cells that are identified and measured according to the measurement rules.

The UE shall filter RSRP measurements of each measured intra-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Intra}$ / 2.

For an intra-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the intra-frequency cell has met the re-selection criterion defined in TS 36.304 [6] within $T_{evaluate,E\text{-}UTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0 provided that the cell is at least 3 dB better ranked. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

If Treselection timer has a non-zero value and the intra-frequency cell is better ranked than the serving cell, the UE shall evaluate this intra-frequency cell for the Treselection time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the intra-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At intra-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target intra-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.3 and A.4.2.2.

4.2.2.4 Test description

4.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Table clause C.0 and C.1 for this test.

Table 4.2.2.4.1-1: General Test Parameters for E-UTRAN TDD-TDD intra cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2	
T2 end condition	Active cell		Cell2	
	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		s	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
T3		s	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier. In the test there are three successive time periods, with time duration of T1, T2, and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A. Set Cell 2 physical cell identity = initial cell 2 physical cell identity.

2. Set the parameters according to T1 in Table 4.2.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for one iteration of the test procedure loop.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.2.5-1.

5. The SS waits for random access requests information from the UE to perform cell re-selectionto a newly detectable cell, Cell 2.

6. If the UE responds on the newly detectable cell, Cell 2, during time duration T2 within 34 seconds from the beginning of time period T2, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.2.5-1.

8. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.

9. If the UE responds on the already detected cell, Cell 1, during time duration T3 within 8 seconds from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

10. When T3 expires, repeat step 2-9 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.1-1 Table H.2.1-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.2.2.5 Test requirement

Tables 4.2.2.4.1-1, and 4.2.2.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra frequency cell re-selection test case.

Table 4.2.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD intra frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Pattern defined in D.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD		
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note 1] OCNG_RB[Note 1]	dB	0			0		
Qrxlevmin	dBm	-140			-140		
Pcompensation	dB	0			0		
$Qhyst_s$	dB	0			0		
$Qoffset_{s, n}$	dB	0			0		
Cell_selection_and_reselection_quality_measurement		RSRP			RSRP		
$\hat{E}_s/I_{ot}$	dB	16.00	-3.55	3.24	-infinity	3.24	-3.55
N_{oc}	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	16.00	13.00	16.45	-infinity	16.45	13.00
RSRP	dBm/15 kHz	-82.00	-85.00	-81. 55	-infinity	-81. 55	-85.00
Treselection	s	0	0	0	0	0	0
Sintrasearch	dB	Not sent			Not sent		
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

The cell re-selection delay to a newly detectable cell is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to a newly detectable cell test requirement in this case is expressed as:

Cell re-selection delay to a newly detectable cell = $T_{detect,EUTRAN\_Intra} + T_{SI-EUTRA}$

$T_{detect,EUTRAN\_Intra}$ = 32 s; as specified in TS 36.133 [4] clause 4.2.2.3.

$T_{SI-EUTRA}$ = 1280 ms; maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell is assumed in this test; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to a newly detectable cell shall be less than a total of 34 seconds in this test case (note: this gives a total of 33.28 seconds but the test allows 34 seconds).

The cell re-selection delay to an already detected cell is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 1 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to an already detected cell test requirement in this case is expressed as:

Cell re-selection to an already detected cell delay = $T_{evaluate,E-UTRAN\_Intra} + T_{SI-EUTRA}$

$T_{evaluate,E-UTRAN\_Intra}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3

$T_{SI-EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to an already detected cell shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.2.3 E-UTRAN FDD - FDD cell re-selection inter frequency case

4.2.3.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

4.2.3.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E-UTRAN\_Inter}$ + $T_{SI-EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority E-UTRA carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for lower or equal priority inter-frequency layers.

The UE shall be able to evaluate whether a newly detectable lower or equal priority inter-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ (as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4) if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $Treselection_{EUTRAN}$ = 0 provides that the re-selection criteria is met by a margin of at least 5 dB for re-selection based on ranking or 6 dB for re-selection based on absolute priorities. The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,EUTRAN\_Inter}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateFDD,\ Inter}$ + $Treselection_{EUTRAN}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ DRX cycle as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 for identified lower or equal priority inter-frequency cells. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}$ / 2.

The UE shall not consider an E-UTRA neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met re-selection criterion defined in TS 36.304 [6] within $K_{carrier}$ * $T_{evaluate,E-UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{EUTRAN} = 0$ provides that the re-selection criteria is met by a margin of at least 5 dB for re-selection based on ranking or 6 dB for re-selection based on absolute priorities. When evaluating cells for re-selection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $Treselection_{EUTRAN}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $Treselection_{EUTRAN}$ time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $Treselection_{EUTRAN}$ is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $Treselection_{EUTRAN}$ timer.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells) , cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.3.

4.2.3.4 Test description

4.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.3.4.3.
5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.2.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two FDD carrier frequencies are used.
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one of the E-UTRA FDD carriers. In the test there are three successive time periods, with time duration of T1, T2 and T3 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 2 is of higher priority than Cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 1.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to duration T0 in Table 4.2.3.5-1
3. Set the parameters according to duration T1 in Table 4.2.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
4. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 1.
5. If the UE responds on lower priority cell, Cell 1 during time duration T1 within 8 seconds from the beginning of time period T1 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.3.5-2. During time duration T2, Cell 2 shall be powered OFF and the physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) shall be changed to ensure Cell 2 is not detected by the UE.
7. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.3.5-2.
8. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 2.
9. If the UE responds on higher priority cell, Cell 2 during time duration T3 within 68 seconds from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
10. Repeat step 3-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

4.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.2.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1 Table H.2.2-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.2.3.5 Test requirement

Tables 4.2.3.4.1-1, 4.2.3.5-1 and 4.2.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency cell re-selection test case. Note that the time period for T0 is system implementation dependent.

Table 4.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1	Cell 2
		T0	
E-UTRA RF Channel number		1	2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

Qrxlevmin	dBm	-140	
N_{oc} Note 2	dBm/15 kHz	-99,1	
RSRP Note 3	dBm/15 KHz	-102.8	-83.2
$\hat{E}_s/I_{ot}$	dB	-3.70	15.90
$\hat{E}_s/N_{oc}$	dB	-3.70	15.90
$Treselection_{EUTRAN}$	S	0	0
Snonintrasearch	dB	50	Not sent
$Thresh_{x, high}$	dB	48	48
$Thresh_{serving, low}$	dB	44	44
$Thresh_{x, low}$	dB	50	50
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 4.2.3.5-2: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD			OP.2 FDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

Qrxlevmin	dBm	-140			-140		
N_{oc} Note 2	dBm/15 kHz	-99,1					
RSRP Note 3	dBm/15 KHz	-83.2	-83.2	-83.2	-102.8	-infinity	-85.2
$\hat{E}_s/I_{ot}$	dB	15.90	15.90	15.90	-3.70	-infinity	13.90
$\hat{E}_s/N_{oc}$	dB	15.90	15.90	15.90	-3.70	-infinity	13.90
$Treselection_{EUTRAN}$	S	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x, high}$	dB	48			48		
$Thresh_{serving, low}$	dB	44			44		
$Thresh_{x, low}$	dB	50			50		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.							
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search} + T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.2.4 E-UTRAN FDD - TDD cell re-selection inter frequency case

4.2.5 E-UTRAN TDD - FDD cell re-selection inter frequency case

4.2.6 E-UTRAN TDD - TDD cell re-selection inter frequency case

4.2.6.1 Test purpose

To verify that when the neighbour cell operates on a different carrier frequency, compared to the current cell the UE is able to search and measure cells to meet the inter-frequency cell re-selection requirements.

4.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

4.2.6.3 Minimum conformance requirements

The cell re-selection delay shall be less than $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$ in RRC_IDLE state.

The UE shall be able to identify new inter-frequency cells and perform RSRP measurements of identified inter-frequency cells if carrier frequency information is provided by the serving cell, even if no explicit neighbour list with physical layer cell identities is provided.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 4.2.2 of TS 36.133 [4].

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below for a lower or equal priority inter-frequency layers.

The UE shall be able to evaluate whether a newly detectable lower or equal priority inter-frequency cell meets the re-selection criteria defined in TS 36.304 [6] within $K_{carrier}$ * $T_{detect,EUTRAN\_Inter}$ (as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4) if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $Treselection_{EUTRAN}$ = 0 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for reselections based on absolute priorities. The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{measure,EUTRAN\_Inter}$. If, after it is found in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell. If the UE detects on a E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall measure RSRP at least every $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 for identified lower or equal priority inter-frequency cells. If the UE detects on an E-UTRA carrier a cell whose physical identity is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform measurements on that cell.

The UE shall filter RSRP measurements of each measured higher, lower and equal priority inter-frequency cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least $T_{measure,EUTRAN\_Inter}$ / 2.

The UE shall not consider an E-UTRA neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

For an inter-frequency cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met re-selection criterion defined in TS

36.304 [6] within $K_{carrier}$ * $T_{evaluate,E-UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{EUTRAN}$ = 0 provides that the re-selection criteria is met by a margin of at least 5dB for re-selection based on ranking or 6dB for re-selection based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $Treselection_{EUTRAN}$ timer has a non-zero value and the inter-frequency cell is better ranked than the serving cell, the UE shall evaluate this inter-frequency cell for the $Treselection_{EUTRAN}$ time. If this cell remains better ranked within this duration, then the UE shall re-select that cell.

The UE shall evaluate the inter-frequency cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds.

At inter-frequency cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels of the target inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SI-EUTRA}$ + 50 ms. $T_{SI-EUTRA}$ is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks as defined in TS 36.331 [5] for a E-UTRAN cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.4 and A.4.2.6.

4.2.6.4 Test description

4.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.2.6.4.3.
5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 2 is the cell used for registration with the power level set according to clause C.0 and C.1for this test.

Table 4.2.6.4.1-1: General Test Parameters for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA RF Channel Number			1, 2	Two TDD carrier frequencies are used.
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		s	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.2.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier. In the test there are three successive time periods, with time duration of T1, T2, and T3 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas and Cell 2 is of higher priority than Cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 1.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.

2. Set the parameters according to duration T1 in Table 4.2.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.

4. If the UE responds on the lower priority cell, Cell 1, during time duration T1 within 8 seconds from the beginning of time period T1 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.6.5-1. During time duration T2, Cell 2 shall be powered OFF and change Cell 2 physical cell identity to ((current cell 2 physical cell identity + 1) mod 14 + 2) to ensure Cell 2 is not detected by the UE.

6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.6.5-1.

7. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

8. If the UE responds on higher priority cell, Cell 2, during time duration T3 within 68 seconds from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

9. Repeat step 1-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2.3 is achieved.

4.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.4.3.3 and 4.6.3 with the following exceptions:

Table 4.2.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.2-1 Table H.2.2-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.2.6.5 Test requirement

Tables 4.2.6.4.1-1 and 4.2.6.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD inter frequency cell re-selection test case.

Table 4.2.6.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD-TDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Pattern defined in D.2.2 (OP.2 TDD)		OP.2 TDD			OP.2 TDD		
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
Qrxlevmin	dBm	-140			-140		
N_{oc}	dBm/15 kHz	-99,1					
RSRP	dBm/15 KHz	-83.2	-83.2	-83.2	-102.8	-infinity	-85.2
$\hat{E}_s/I_{ot}$	dB	15.90	15.90	15.90	-3.70	-infinity	13.90
$\hat{E}_s/N_{oc}$	dB	15.90	15.90	15.90	-3.70	-infinity	13.90
$Treselection_{EUTRAN}$	S	0			0		
Snonintrasearch	dB	50			Not sent		
$Thresh_{x,\ high}$	dB	48			48		
$Thresh_{serving,\ low}$	dB	44			44		
$Thresh_{x,\ low}$	dB	50			50		
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The cell re-selection delay to higher priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority test requirement in this case is expressed as:

Cell re-selection delay to higher priority = $T_{higher\_priority\_search}$ + $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{higher\_priority\_search}$ = 60 s; as specified in TS 36.133 [4] clause 4.2.2

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to higher priority shall be less than a total of 68 seconds in this test case (note: this gives a total of 67.68 seconds but the test allows 68 seconds).

The cell re-selection delay to lower priority is defined as the time from the beginning of time period T1, to the moment when the UE camps on Cell 1 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 1.The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluate,E\text{-}UTRAN\_Inter}$ + $T_{SI\text{-}EUTRA}$

$T_{evaluate,E\text{-}UTRAN\_Inter}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.4

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.7

The cell re-selection delay to lower priority shall be less than a total of 8 seconds in this test case (note: this gives a total of 7.68 seconds but the test allows 8 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3 E-UTRAN to UTRAN Cell Re-Selection

4.3.1 E-UTRAN FDD - UTRAN FDD cell re-selection

4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority

4.3.1.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of higher priority.

4.3.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

4.3.1.1.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier}$ is the number of carriers in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier}$ * $T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier}$ * $T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier}$ * $T_{evaluateUTRA\_FDD}$ as defined in table 4.2.2.5-1 of TS 36.133 [4] clause 4.2.2.5 when $Treselection_{RAT}$ = 0.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.1.

4.3.1.1.4 Test description

4.3.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The general test parameter settings are set up according to Table 4.3.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.3.1.1.4.3.

5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 4.5.2A with the power level set according to Annex C.0 and C.1.

Table 4.3.1.1.4.1-1: General test parameters for E-UTRA FDD- higher priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during T2
T2 end condition	Active cell		Cell 2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell 1	
T3 end condition	Active cell		Cell 1	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell 2	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account
T3		s	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.

4.3.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Before T1 the UE is camped on to cell 1. During T1, cell 2 shall be powered off, and during the off time the scrambling code shall be changed. At the start of T2 cell 2 becomes stronger than $Thresh_{x\_high}$, the UE is expected to detect cell 2, send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 2. At the start of T3 cell 2 becomes weaker than $Thresh_{serving\_low}$, and the UE reselects to Cell 1.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to duration T1 in Table 4.3.1.1.5-1 and 4.3.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. During T1, Cell 2 shall be powered off and the SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100).
4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.1.5-1 and 4.3.1.1.5-2. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2..
5. If the UE camps on Cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on Cell 2 within 81s from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.1.5-1 and 4.3.1.1.5-2.
7. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.
8. Repeat step 2-7 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.3.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-1 Table H.2.3-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

The UTRA system information for inter-RAT frequency and priority information to be used during the initialisation phase is not defined in the message contents exceptions.

4.3.1.1.5 Test requirement

Tables 4.3.1.1.4-1, 4.3.1.1.5-1 and 4.3.1.1.5-2 define the primary level settings including test tolerances for cell re-selection E-UTRA FDD to UTRA FDD test case (UTRA is of higher priority).

Table 4.3.1.1.5-1: Cell specific Test Parameters for Cell 1(E-UTRA FDD)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in A.3.2.1.1 (OP.2 FDD)		OP.2 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA^Note 1^	dB			
OCNG_RB^Note 1^	dB			
Qqualmin for UTRA neighbour cell	dB	-20		
Qrxlevmin for UTRA neighbour cell	dBm	-115		
Qrxlevmin	dBm	-140		
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-83.20	-83.20	-83.20
$\hat{E}_s/I_{ot}$	dB	14.80	14.80	14.80
$\hat{E}_s/N_{oc}$	dB	14.80	14.80	14.80
$Treselection_{EUTRAN}$	s	0		
Snonintrasearch	dB	50		
$Thresh_{x, high}$ (Note 2)	dB	40		
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2 : This refers to the value of $Thresh_{x, high}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell				

Table 4.3.1.1.5-2: Cell specific test parameters for Cell 2 (higher priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
UTRA RF Channel Number		Channel 2		
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
OCNS_Ec/Ior	dB	-0.941		
$\hat{I}_{or}/I_{oc}$	dB	-∞	11.90	-5.70
I_{oc}	dBm/3,84 MHz	-70.10		
CPICH_Ec/Io	dB	-∞	-10.27	-16.74
CPICH_RSCP	dBm	-∞	-68.20	-85.80
Propagation Condition		AWGN		
Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
QrxlevminEUTRA	dBm	-140		
UE_TXPWR_MAX_RACH	dBm	21		
Treselection	s	0		
Sprioritysearch1	dB	62		
Sprioritysearch2	dB	0		
$Thresh_{serving, low}$	dB	36		
$Thresh_{x, low}$ (Note 1)	dB	50		
Note: This refers to the value of $Thresh_{x, low}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.				

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search} + T_{evaluateUTRA\_FDD} + T_{SI-UTRA}$

Where:

$T_{higher\_priority\_search}$ See section 4.4.2; 60s is assumed in this test case

$T_{evaluateUTRA-FDD}$ See Table 4.2.2.5.1-1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s for higher priority cell search, allow 81 s for higher priority cell reselection in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority

4.3.1.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

4.3.1.2.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search} = (60 * N_{layers})$ seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure such layers is not reduced and shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) when the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least [6 dB].

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells o the same frequency layer) is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2 when $Treselection_{RAT} = 0$.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.1.

4.3.1.2.4 Test description

4.3.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The general test parameter settings are set up according to Table 4.3.1.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.2.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 4.5.2A with the power level set according to Annex C.0 and C.1.

Table 4.3.1.2.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	Neighbour cell		Cell2	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table 4.3.1.2.5-1 and 4.3.1.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.1.2.5-1 and 4.3.1.2.5-2.
4. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 2-5 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.3.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.1.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6
Default RRC messages and information elements contents exceptions	Table H.3.2-1

The UTRA system information for inter-RAT frequency and priority information to be used during the initialisation phase is not defined in the message contents exceptions.

4.3.1.2.5 Test requirement

Tables 4.3.1.2.4.1-1, 4.3.1.2.5-1 and 4.3.1.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.1.2.5-1

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Cell 1</th></tr>
<tr><th>T1</th><th>T2</th></tr>
<tr><td>E-UTRA RF Channel number</td><td></td><td colspan="2">1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="2">10</td></tr>
<tr><td>OCNG Patterns defined in A.3.2.1.1 (OP.2 FDD)</td><td></td><td colspan="2">OP.2 FDD</td></tr>
<tr><td>PBCH_RA</td><td>dB</td><td colspan="2" rowspan="13">0</td></tr>
<tr><td>PBCH_RB</td><td>dB</td></tr>
<tr><td>PSS_RA</td><td>dB</td></tr>
<tr><td>SSS_RA</td><td>dB</td></tr>
<tr><td>PCFICH_RB</td><td>dB</td></tr>
<tr><td>PHICH_RA</td><td>dB</td></tr>
<tr><td>PHICH_RB</td><td>dB</td></tr>
<tr><td>PDCCH_RA</td><td>dB</td></tr>
<tr><td>PDCCH_RB</td><td>dB</td></tr>
<tr><td>PDSCH_RA</td><td>dB</td></tr>
<tr><td>PDSCH_RB</td><td>dB</td></tr>
<tr><td>OCNG_RA[Note 1]</td><td>dB</td></tr>
<tr><td>OCNG_RB[Note 1]</td><td>dB</td></tr>
<tr><td>Qqualmin for UTRA neighbour cell</td><td>dB</td><td colspan="2">-20</td></tr>
<tr><td>Qrxlevmin for UTRA neighbour cell</td><td>dBm</td><td colspan="2">-115</td></tr>
<tr><td>Qrxlevmin</td><td>dBm</td><td colspan="2">-140</td></tr>
<tr><td>N_{oc}</td><td>dBm/15 kHz</td><td colspan="2">-99.10</td></tr>
<tr><td>RSRP</td><td>dBm/15 KHz</td><td>-85.20</td><td>-102.80</td></tr>
<tr><td>$\hat{E}_s/I_{ot}$</td><td>dB</td><td>13.90</td><td>-3.70</td></tr>
<tr><td>$\hat{E}_s/N_{oc}$</td><td>dB</td><td>13.90</td><td>-3.70</td></tr>
<tr><td>$Treselection_{EUTRAN}$</td><td>s</td><td colspan="2">0</td></tr>
<tr><td>Snonintrasearch</td><td>dB</td><td colspan="2">Not sent</td></tr>
<tr><td>$Thresh_{serving, low}$</td><td>dB</td><td colspan="2">44</td></tr>
<tr><td>$Thresh_{x, low}$ (Note 2)</td><td>dB</td><td colspan="2">42</td></tr>
<tr><td>Propagation Condition</td><td></td><td colspan="2">AWGN</td></tr>
<tr><td colspan="4">Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.</td></tr>
</table>

Table 4.3.1.2.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 2	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	13.80	13.80
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10. 18	-10. 18
CPICH_RSCP	dBm	-66.20	-66.20
Propagation Condition		AWGN	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
QrxlevminEUTRA	dBm	-140	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	s	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
$\text{Thresh}_{\text{x, high}}$ (Note 1)	dB	48	
Note: This refers to the value of $\text{Thresh}_{\text{x, high}}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.			

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{\text{evaluateUTRA\_FDD}} + T_{\text{SI-EUTRA}}$

$T_{\text{evaluateUTRA\_FDD}}$ = 19.2 s; as specified in TS 36.133 [4] clause 4.2.2.5

$T_{\text{SI-EUTRA}}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.1.3 E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined.*

4.3.1.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

4.3.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

4.3.1.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search} = (60 * N_{layers})$ seconds, where the parameters N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD} * T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) when the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT} = 0$ provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD} + Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier} * T_{evaluateUTRA\_FDD}$ as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2 when $Treselection_{RAT} = 0$.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.1.3.

4.3.1.3.4 Test description

4.3.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 4.3.1.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.1.3.4.3.
5. There is one E-UTRA FDD cell and one UTRA FDD cell specified in the test. Cell 1 is the cell used for registration according to TS 36.508 [7] clause 4.5.2A with the power level set according to Annex C.0 and C.1. After the registration with E-UTRA cell, the UE shall be forced to Cell 2 in place.

Table 4.3.1.3.4.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case in fading conditions

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211 [9]
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		s	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
T3		s	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send preambles to cell 2
T4		s	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

4.3.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are four successive time periods, with time duration of T1, T2, T3 and T4 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 2 is of lower priority than Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2. Time duration T2 and T4 are not used for cell re-selection in the test.

1. Ensure the UE is in idle mode in cell 2 to camp on.
2. Set the parameters according to T1 in Table 4.3.1.3.5-1 and 4.3.1.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T3 as specified in Table 4.3.1.3.5-1 and 4.3.1.3.5-2.
4. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T3 within 21 seconds from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 1-5 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.3.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.1.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6
Default RRC messages and information elements contents exceptions	Table H.3.2-1

The UTRA system information for inter-RAT frequency and priority information to be used during the initialisation phase is not defined in the message contents exceptions.

4.3.1.3.5 Test requirement

Tables 4.3.1.3.4.1-1, 4.3.1.3.5-1 and 4.3.1.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD- UTRAN FDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.1.3.5-1

Parameter	Unit	Cell 1			
		T1	T2	T3	T4
E-UTRA RF Channel number		1			
$BW_{channel}$	MHz	10			
OCNG Patterns defined in A.3.2.1.1 (OP.2 FDD)		OP.2 FDD			
PSS_RA	dB	0			
SSS_RA	dB	0			
PCFICH_RB	dB	0			
PHICH_RA	dB	0			
PHICH_RB	dB	0			
PDCCH_RA	dB	0			
PDCCH_RB	dB	0			
PDSCH_RA	dB	0			
PDSCH_RB	dB	0			
OCNG_RA Note 1	dB	0			
OCNG_RB Note 1	dB	0			
Qqualmin for UTRA neighbour cell	dB	-20			
Qrxlevmin for UTRA neighbour cell	dBm	-115			
Qrxlevmin	dBm	-140			
N_{oc}	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82 + TT	-82 + TT	-107 + TT	-107 + TT
$\hat{E}_s/I_{ot}$	dB	22 + TT	22 + TT	-3 + TT	-3 + TT
$\hat{E}_s/N_{oc}$	dB	22 + TT	22 + TT	-3 + TT	-3 + TT
$Treselection_{EUTRAN}$	s	0			
Snonintrasearch	dB	Not sent			
$Thresh_{serving, low}$	dB	44			
$Thresh_{x, low}$ (Note 2)	dB	42			
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total t spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system inform threshold for the UTRA target cell.					

Table 4.3.1.3.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2	T3	T4
UTRA RF Channel Number		Channel 2			
CPICH_Ec/Ior	dB	-10			
PCCPCH_Ec/Ior	dB	-12			
SCH_Ec/Ior	dB	-12			
PICH_Ec/Ior	dB	-15			
OCNS_Ec/Ior	dB	-0.941			
$\hat{I}_{or}/I_{oc}$	dB	13 + TT	13 + TT	13 + TT	13 + TT
I_{oc}	dBm/3,84 MHz	-70			
CPICH_Ec/Io	dB	-10.21 + TT	-10.21 + TT	-10.21 + TT	-102.1 + TT
CPICH_RSCP	dBm	-67 + TT	-67 + TT	-67 + TT	-67 + TT
Propagation Condition		AWGN			
Qqualmin	dB	-20			
Qrxlevmin	dBm	-115			
QrxlevminEUTRA	dBm	-140			
UE_TXPWR_MAX_RACH	dBm	21			
Treselection	s	0			
Sprioritysearch1	dB	42			
Sprioritysearch2	dB	0			
$\text{Thresh}_{x,\ high}$ (Note 1)	dB	44			
Note 1: This refers to the value of $\text{Thresh}_{\mathbf{x,\ high}}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell					

The probability of re-selection from Cell 1 to Cell 2 during T2 observed during testing shall be less than 10%.

The probability of re-selection from Cell 2 to Cell 1 during T4 observed during testing shall be less than 10%.

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on Cell 2 and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUST message on Cell 2. In order to evaluate re-selection delay, the SS first needs to verify that the UE is camped on Cell 1 at the start of T3.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluateUTRA\_FDD} + T_{SI\text{-}EUTRA}$

$T_{evaluateUTRA\_FDD}$ = 19.2 s; as specified in TS 36.133 [4] clause 4.2.2.5

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.2 E-UTRAN FDD - UTRAN TDD cell re-selection

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test tolerances applicable to this test are undefined*
- *The Test system uncertainties applicable to this test are undefined*

4.3.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRAN TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA cell is of lower priority.

4.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRAN TDD.

4.3.2.3 Minimum conformance requirements

4.3.2.3.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.3.2 1.28Mcps TDD option

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate specified in this section. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period. P-CCPCH RSCP of UTRAN TDD cells shall not be filtered over a longer period than that specified in TS 36.133 [4] table 4.2.2.5.2-1.

If the $S_{ServingCell}$of the E-UTRA serving cell is greater than $S_{nonintrasearch}$then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in section 36.133[4] clauses 4.2.2.

If the $S_{ServingCell}$of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$then the UE shall search for and measure inter-RAT layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the reselection criteria in TS 36.304 within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is less than $S_{nonintrasearch}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA\_TDD}$. If, after detecting a cell in a higher priority search, it is determined that reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection. However, the minimum measurement filtering requirements specified later in this section shall still be met by the UE before it makes any determination that it may stop measuring the cell.

For a cell that has been already detected, but that has not been reselected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met reselection criterion defined in TS 36.304[6] within $N_{UTRA\_carrier\_TDD}$ *$T_{evaluateUTRA\_TDD}$ when $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least 6 dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.2.

4.3.2.3.3 7.68Mcps TDD option

There are no requirements so this is not tested.

4.3.2.4 Test description

4.3.2.4.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.4.2 1.28Mcps TDD option

4.3.2.4.2.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.3.2.4.2.1-1.
3. Propagation conditions are set according to Annex B clause B. 0.
4. Message contents are as defined in clause 4.3.2.4.2.3.
5. There is one E-UTRA FDD cell and one UTRA TDD cell specified in the test. Cell 2 (UTRA TDD cell) is the cell used for registration with the power level set according to T2 in table 4.3.2.5.2-2.

Table 4.3.2.4.2.1-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	E-UTRA FDD cell
CP length of cell 1			normal	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	

4.3.2.4.2.2 Test procedure

The test consists of one active cell and one neighbour cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the test. Cell 1 and Cell 2 belong to different tracking areas. The UTRA TDD layer is configured at a lower priority than the E-UTRA FDD layer.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS 36.304.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table 4.3.2.5.2-1 and 4.3.2.5.2-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The SS waits for random access requests information from the UE to perform cell re-selection on the higher priority cell, Cell 1.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.2.5.2-1 and 4.3.2.5.2-2.

5. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 2.

6. If the UE responds on lower priority cell, Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. Repeat step 1-6 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved

4.3.2.4.2.3 Message contents

Message contents are according TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.2.4.2.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 4.3.2.4.2.3-2: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD - UTRA TDD cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	23 (46 dB)	46 is actual value in dB (23 * 2 dB)	

Table 4.3.2.4.2.3-3: *PRACH-ConfigCommonDEFAULT*: Additional E-UTRAN FDD to UTRA TDD cell re-selection test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-ConfCommonDEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
Prach-ConfigInfo SEQUENCE {			
Prach-ConfigurationIndex	4		

4.3.2.4.3 7.68 Mcps TDD option

There are no requirements so this is not tested.

4.3.2.5 Test requirement

4.3.2.5.1 3.84Mcps TDD option

There are no requirements so this is not tested.

4.3.2.5.2 1.28Mcps TDD option

Tables 4.3.2.4.2-1, 4.3.2.5.2-1 and 4.3.2.5.2-2 defines the primary level settings including test tolerances for E-UTRAN FDD to UTRA TDD cell re-selection test case.

Table 4.3.2.5.2-1: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA[Note1]	dB		
OCNG_RB[Note1]	dB		
Qrxlevmin	dBm/15kHz	-140	-140
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-87+TT	-101+TT
$\hat{E}_s/I_{ot}$	dB	11+TT	-3+TT
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	46 (-94dBm)	
$Thresh_{x, low}$ (Note2)	dB	24 (-79dBm)	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA TDD target cell.

Table 4.3.2.5.2-2: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/Ior	dB	-3+TT	-3+TT		
DwPCH_Ec/Ior	dB			0+TT	0+TT
OCNS_Ec/Ior	dB	-3+TT	-3+TT		
$\hat{I}_{or}/I_{oc}$	dB	11+TT	11+TT	11+TT	11+TT
I_{oc}	dBm/1.28 MHz	-80 +TT			
PCCPCH RSCP	dBm	-72+TT	-72+TT	n.a.	n.a.
Propagation Condition		AWGN			
Qrxlevmin	dBm	-103			
$Qoffset1_{s,n}$	dB	C1, C2: 0			
$Qhyst1_{s}$	dB	0			
$Thresh_{x,\ high}$ (Note2)	dB	46 (-94dBm)			
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of $Thresh_{x,\ high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.					

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority shall be less than 21 s.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

NOTE: The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateUTRA\_TDD} + T_{SI-UTRA}$

Where:

$T_{evaluateUTRA\_TDD}$ 19.2s, as specified in TS 36.133 [4] table 4.2.2.5.2-1

$T_{SI-UTRA}$ Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 20.48 s, allow 21 s for lower priority cell reselection in the test case.

4.3.2.5.3 7.68 Mcps TDD option

There are no requirements so this is not tested.

4.3.3 E-UTRAN TDD - UTRAN FDD cell re-selection

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined.*
- Statistical testing of cell re-selection delay performance requirements are undefined

4.3.3.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA FDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD.

4.3.3.3 Minimum conformance requirements

When the measurement rules indicate that UTRA FDD cells are to be measured, the UE shall measure CPICH Ec/Io and CPICH RSCP of detected UTRA FDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter CPICH Ec/Io and CPICH RSCP measurements of each measured UTRA FDD cell using at least 2 measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA FDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_FDD}$ * $T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) when the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0 provided that the re-selection criteria is met by a margin of at least 6 dB.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier}$ * $T_{measureUTRA\_FDD}$ when the $S_{ServingCell}$ of the E-UTRA serving cell is less than $S_{nonintrasearch}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_FDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_FDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA FDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier}$ * $T_{evaluateUTRA\_FDD}$ as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1 when $Treselection_{RAT}$ = 0.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.1 and A.4.3.3.

4.3.3.4 Test description

4.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The general test parameter settings are set up according to Table 4.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.3.4.3.
5. There is one E-UTRA TDD cell and one UTRA FDD cell specified in the test. Cell 2 (UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.3.3.4.1-1: General test parameters for EUTRA TDD- lower priority UTRA FDD inter RAT cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	
E-UTRA PRACH configuration			53	As specified in table 5.7.1-2 in TS 36.211
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	85	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	25	T2 need to be defined so that cell re-selection reaction time is taken into account.

4.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA FDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than Cell 1.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table 4.3.3.5-1 and 4.3.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.3.5-1 and 4.3.3.5-2.
4. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 1-5 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.3.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-5 Table H.2.3-6
Default RRC messages and information elements contents exceptions	Table H.3.2-2

The UTRA system information for inter-RAT frequency and priority information to be used during the initialisation phase is not defined in the message contents exceptions.

4.3.3.5 Test requirement

Tables 4.3.3.4.1-1, 4.3.3.5-1 and 4.3.3.5-2 define the primary level settings including test tolerances for E-UTRAN TDD- UTRAN FDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.3.5-1: Cell specific test parameters for Cell 1(E-UTRA TDD)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		
Qqualmin for UTRA neighbour cell	dB	-20	
Qrxlevmin for UTRA neighbour cell	dBm	-115	
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 KHz	-86 + TT	-102 + TT
$\hat{E}_s/I_{ot}$	dB	12 + TT	-4 + TT
$\hat{E}_s/N_{oc}$	dB	12 + TT	-4 + TT
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	42	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.			

Table 4.3.3.5-2: Cell specific test parameters for Cell 2(Lower priority UTRA FDD)

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
UTRA RF Channel Number		Channel 2	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
OCNS_Ec/Ior	dB	-0.941	
$\hat{I}_{or}/I_{oc}$	dB	13+TT	13+TT
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.21 + TT	-10.21 + TT
CPICH_RSCP	dBm	-67+TT	-67+TT
Propagation Condition		AWGN	
Qqualmin	dB	-20	
Qrxlevmin	dBm	-115	
QrxlevminEUTRA	dBm	-140	
UE_TXPWR_MAX_RACH	dBm	21	
Treselection	S	0	
Sprioritysearch1	dB	42	
Sprioritysearch2	dB	0	
$Thresh_{x,\ high}$ (Note 1)	dB	48	
Note: This refers to the value of $Thresh_{x,\ high}$ which is included in UTRA system information, and is a threshold for the E-UTRA target cell.			

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to lower priority test requirement in this case is expressed as:

Cell re-selection delay to lower priority = $T_{evaluateUTRA\_FDD} + T_{SI\text{-}EUTRA}$

$T_{evaluateUTRA\_FDD}$ = 19.2 s; as specified in TS 36.133 [4] clause 4.2.2.5

$T_{SI\text{-}EUTRA}$ = 1280 ms; as specified in TS 36.133 [4] clause 4.2.2.4

The cell re-selection delay to lower priority shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4 E-UTRAN TDD - UTRAN TDD cell re-selection

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Statistical testing of UE measurement performance requirements are undefined*
- *Message contents are undefined*

4.3.4.1 E-UTRA TDD - UTRAN TDD cell re-selection : UTRA is of higher priority

4.3.4.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of higher priority.

4.3.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

4.3.4.1.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least [2] measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$then:

- The UE may not search for, or measure inter-RAT layers of equal or lower priority.
- The UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_TDD}$ * $T_{detectUTRA\_TDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) except when UTRA TDD is of higher priority than the currently selected E-UTRA frequency layer and the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier\_TDD}$ * $T_{measureUTRA\_TDD}$ except when UTRA TDD is of higher priority than the currently selected E-UTRA frequency layer and the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_TDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_TDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met re-selection criterion defined in TS 36.304 6] within $N_{UTRA\_carrier\_TDD}$ * $T_{evaluateUTRA\_TDD}$ as defined in table 4.2.2.5.2-1 of TS 36.133 [4 clause 4.2.2.5.2 when $Treselection_{RAT}$ = 0.as specified in table 4.2.2.5.2-1 provided that the reselection criteria is met by a margin of at least [6]dB.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.

4.3.4.1.4 Test description

4.3.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: [Lowest, 5MHz, and Highest channel bandwidth as defined in TS 36.508 [7] clause 4.3.1.2.]

1. Connect the SS (node B/eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.3.4.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.3.41..4.3.

5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 2 is the cell used for registration.

Table 4.3.4.1.4.1-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
PRACH configuration of cell 1			53	As specified in table 4.7.1-3 in TS 36.211
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	25	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	>20	During T2, cell 2 shall be powered off, and during the off time the scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3
T3		s	85	T3 need to be defined so that cell re-selection reaction time is taken into account.

4.3.4.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. During T2, cell 2 shall be powered off, and during the off time the scrambling code shall be changed. At starting T3 cell 2 becomes stronger than Thresh$_{x_high}$, the UE is expected to detect cell 2, send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on cell 2.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.

2. Set the parameters according to duration T1 in Table 4.3.4.1.5-1and 4.3.4.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the lower priority cell, Cell 1.

4. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.3.4.1.5-1 and 4.3.4.1.5-2. During T2, cell 2 shall be powered off and the SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100).

5. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.3.4.1.5-1 and 4.3.4.1.5-2.

6. The SS waits for random access requests information from the UE to perform cell re-selection procedure on the higher priority cell, Cell 2.

7. If the UE camps on cell2 , and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message on cell2 within 81s from the beginning of time period T3. then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

8. Repeat step 1-7 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.1.4.3 Message contents

Message contents are according to [clause FFS in reference FFS].

4.3.4.1.5 Test requirement

Tables 4.3.4.1.4-1, 4.3.4.1.5-1 and 4.3.4.1.5-2 define the primary level settings including test tolerances for cell re-selection E-UTRA TDD to UTRA TDD test case (UTRA is of higher priority).

Table 4.3.4.1.5-1: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RB	dB			
SSS_RB	dB			
PCFICH_PA	dB			
PHICH_PA	dB			
PHICH_PB	dB			
PDCCH_PA	dB			
PDCCH_PB	dB			
PDSCH_PA	dB			
PDSCH_PB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
$Q_{rxlevmin}$	dBm/15kHz	-140	-140	-140
N_{oc}	dBm/15kHz	-98		
RSRP	dBm/15kHz	-87+TT	-87+TT	-87+TT
$\hat{E}_s/I_{ot}$	dB	11+TT	11+TT	11+TT
$Thresh_{x,\ high}$ (Note2)	dB	24(-79dBm)		
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of $Thresh_{x,\ high}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell.				

Table 4.3.4.1.5-2: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number (Note1)		Channel 2					
PCCPCH_Ec/Ior	dB	-3	-3	-3			
DwPCH_Ec/Ior	dB				0	0	0
OCNS_Ec/Ior	dB	-3	-3	-3			
$\hat{I}_{or}/I_{oc}$	dB	-3+TT	-inf	11+TT	-3+TT	-inf	11+TT
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86 +TT	-inf	-72+TT	n.a.		
Propagation Condition		AWGN					
$Q_{rxlevmin}$	dBm	-103					
$Qoffset_{s,n}$	dB	C1, C2: 0					
$Qhyst_s$	dB	0					
$S_{nonintrasearch}$	dB	Not sent					
$Thresh_{serving, low}$	dB	24 (-79dBm)					
$Thresh_{x, low}$ (Note2)	dB	46 (-94dBm)					
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of Threshx, low which is included in UTRA system information, and is a threshold for the E-UTRA target cell.							

The cell reselection delay to higher priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

The cell re-selection delay to higher priority shall be less than 81 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90%.

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher\_priority\_search}$ + $T_{evaluateUTRA\_TDD}$ + T_{SI_UTRA},

Where:

$T_{higher\_priority\_search}$ 60s, See s TS 36.133 [4] section 4.2.2.5

$T_{evaluateUTRA\_TDD}$ 19.2s, See TS 36.133 [4] Table 4.2.2.5.2-1

T_{SI_UTRA} Maximum repetition period of relevant system info blocks that need to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

This gives a total of 80.48 s, allow 81 s for higher priority cell reselection in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.3.4.2 E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority

4.3.4.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring UTRA TDD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the UTRA is of lower priority.

4.3.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

4.3.4.2.3 Minimum conformance requirements

When the measurement rules indicate that UTRA TDD cells are to be measured, the UE shall measure P-CCPCH RSCP of detected UTRA TDD cells in the neighbour frequency list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers in the neighbour frequency list. The UE shall filter P-CCPCH RSCP measurements of each measured UTRA TDD cell using at least [2] measurements. Within the set of measurements used for the filtering, at least two measurements shall be spaced by at least half the minimum specified measurement period.

If the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$then:

- The UE may not search for, or measure inter-RAT layers of equal or lower priority.
- The UE shall search for inter-RAT layers of higher priority at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search}$ = (60 * N_{layers}) seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall search for and measure inter-RAT layers of higher, equal or lower priority in preparation for possible re-selection. In this scenario, the minimum rate at which the UE is required to search for and measure such layers is not reduced and shall be the same as that defined below for lower priority RATs.

The UE shall evaluate whether newly detectable UTRA TDD cells have met the re-selection criteria in TS 36.304 [6] within time $N_{UTRA\_carrier\_TDD}$ * $T_{detectUTRA\_TDD}$ (as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2) except when UTRA TDD is of higher priority than the currently selected E-UTRA frequency layer and the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ when $Treselection_{RAT}$ = 0.

Cells which have been detected shall be measured at least every $N_{UTRA\_carrier\_TDD}$ * $T_{measureUTRA\_TDD}$ except when UTRA TDD is of higher priority than the currently selected E-UTRA frequency layer and the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$.

When higher priority UTRA TDD cells are found by the higher priority search, they shall be measured at least every $T_{measureUTRA\_TDD}$. If re-selection to any higher priority cell is not triggered within ($T_{evaluateUTRA\_TDD}$ + $Treselection_{RAT}$) after it is found in a higher priority search, the UE is not required to continue making measurements of the cell to evaluate the ongoing possibility of re-selection.

For a cell that has been already detected, but that has not been re-selected to, the filtering shall be such that the UE shall be capable of evaluating that an already identified UTRA TDD cell has met re-selection criterion defined in TS 36.304 [6] within $N_{UTRA\_carrier\_TDD}$ * $T_{evaluateUTRA\_TDD}$ as defined in table 4.2.2.5.2-1 of TS 36.133 [4] clause 4.2.2.5.2 when $Treselection_{RAT}$ = 0.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.2 and A.4.3.4.

4.3.4.2.4 Test description

4.3.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: [Lowest, 5MHz, and Highest channel bandwidth as defined in TS 36.508 [7] clause 4.3.1.2.]

1. Connect the SS (node B/eNodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.3.4.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.3.4.2.4.3.
5. There is one E-UTRA TDD cell and one UTRA TDD cell specified in the test. Cell 1 is the cell used for registration.

Table 4.3.4.2.4.1-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 2	UE shall be forced to cell 2 in the initialisation phase, so that reselection to cell 1 occurs during the first T1 phase
T1 end condition	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
PRACH configuration of cell 1			53	As specified in table 4.7.1-3 in TS 36.211
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information		-	Not sent	No additional delays in random access procedure.
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not used	
T1		s	85	
T2		s	25	

4.3.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one UTRA TDD carrier. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Both Cell 1 and Cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to Cell 1. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table4.3.4.2.5-1 and 4.3.4.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table4.3.4.2.5-1 and 4.3.4.2.5-2.
4. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 1-5 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.3.4.2.4.3 Message contents

Message contents are according to [clause FFS in reference FFS].

4.3.4.2.5 Test requirement

Tables 4.3.4.2.4.1-1, 4.3.4.2.5-1 and 4.3.4.2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD- UTRAN TDD intra frequency cell re-selection test case which UTRA is of lower priority.

Table 4.3.4.2.5-1: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
BWchannel	MHz	10	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RA(Note1)	dB		
OCNG_RB(Note1)	dB		
Qrxlevmin	dBm/15kHz	-140	-140
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-87+TT	-101+TT
$\hat{E}_s/I_{ot}$	dB	11+TT	-3+TT
Snonintrasearch	dB	Not sent	
Threshserving, low	dB	46 (-94dBm)	
Threshx, low (Note2)	dB	24 (-79dBm)	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to the value of Threshx, low which is included in E-UTRA system information, and is a threshold for the UTRA target cell			

Table 4.3.4.2.5-2: Cell specific test requirement parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	11+TT	11+TT	11+TT	11+TT
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72+TT	-72+TT	n.a.	n.a.
Propagation Condition		AWGN			
$Q_{rxlevmin}$	dBm	-103			
$Qoffset_{s,n}$	dB	C1, C2: 0			
$Qhyst_s$	dB	0			
$Thresh_{x, high}$ (Note2)	dB	46 (-94dBm)			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: This refers to the value of $Thresh_{x, high}$ which is included in UTRA system information and is a threshold for the E-UTRA target cell.					

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2 and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay test requirement in this case is expressed as:

Cell re-selection delay = $T_{evaluateUTRA\_TDD} + T_{SI\_UTRA}$,

$T_{evaluateUTRA\_TDD}$ =19.2s; as specified in TS 36.133 [4] clause 4.2.2.5.2

$T_{SI-UTRA}$ = 1280 ms; Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a cell; 1280 ms is assumed in this test case.

The cell re-selection delay shall be less than a total of 21 seconds in this test case (note: this gives a total of 20.48 seconds but the test allows 21 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.4 E-UTRAN to GSM Cell Re-Selection

4.4.1 E-UTRAN FDD - GSM cell re-selection

4.4.1.1 Test purpose

To verify that the UE is able to search and measure neighbouring GSM cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.4.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM.

4.4.1.3 Minimum conformance requirements

The cell re-selection delay shall be less than 4 * $T_{measure, GSM} + T_{BCCH}$ in RRC_IDLE state.

When the measurement rules defined in TS 36.304 [6] indicates that E-UTRAN inter-frequencies or inter-RAT frequency cells are to be measured, the UE shall measure the signal level of the GSM BCCH carriers if the GSM BCCH carriers are indicated in the measurement control system information of the serving cell, GSM BCCH carriers of lower priority than the serving cell shall be measured at least every $T_{measure,GSM}$ as defined in table 4.2.2.5.3-1 of TS 36.133 [4] clause 4.2.2.5.3.

When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If, after detecting a cell in a higher priority search, it is determined that re-selection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of re-selection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s.

However, the minimum measurement filtering requirements specified shall still be met by the UE before it makes any determination that it may stop measuring the cell.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in TS 36.304 [6], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell re-selection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

The UE shall evaluate the inter-RAT cell re-selection criteria as defined in TS 36.304 [6] at least every DRX cycle. The DRX cycle length is 1.28 seconds. When a non-zero value of $Treselection_{EUTRAN}$ is used, the UE shall only perform re-selection on an evaluation which occurs simultaneously to, or later than the expiry of the $Treselection_{EUTRAN}$ timer.

At inter-RAT cell re-selection, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable to start monitoring downlink channels for paging reception of the target inter-frequency cell. For E-UTRAN to GSM cell re-selection the interruption time must not exceed T_{BCCH} + 50 ms. T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell as defined in TS 45.008 [15] clause 6.2.

For idle mode cell re-selection purposes, the UE shall be capable of monitoring at least:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 32 GSM carriers

In addition to the requirements defined in TS 36.133 [4] clause 4.2.2.9 a UE in RRC_IDLE state shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any defined in TS 36.133 [4] clause 4.2.2.9 combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 cells) , cdma2000 1x and HRPD layers.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.3 and A.4.4.1.

4.4.1.4 Test description

4.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 4.4.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B. 0.
4. Message contents are as defined in clause 4.4.1.4.3.
5. There is one E-UTRA FDD cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.4.1.4.1-1: General Test Parameters for E-UTRAN FDD - GSM cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA FDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA RF Channel Number			1	1 E-UTRA FDD carrier frequency
GSM ARFCN			1	
Monitored GSM cell list size			12 GSM neighbours including ARFCN 1	

PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent	No additional delays in random access procedure.
CP length of cell 1		Normal	
DRX cycle length	s	1.28	The value shall be used for all cells in the test.
T1	s	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2	s	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.
Propagation channel		AWGN	

4.4.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cells on one E-UTRA FDD carrier and twelve GSM cells. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Cell 1 (E-UTRA FDD cell) and Cell 2 (GSM cell) shall belong to different Location Areas. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of Cell 2 but the signal levels do not meet the re-selection criterion during T1. At the start of T2, the signal levels change such that Cell 2 meets the re-selection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA FDD layer.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table's 4.4.1.5-1 and 4.4.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 4.4.1.5-1 and 4.4.1.5-2.
4. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 27.9 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 1-5 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.4.1.4.3-1: Common Exception messages for E-UTRAN FDD - GSM cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-9 Table H.2.3-10
Default RRC messages and information elements contents exceptions	Table H.3.2-1

All GSM cell messages indicated shall use the same content as described in the default message content in TS 45.008 [15] clause 9 for Rel-4 and later releases, with the exceptions above and as specified in Table 4.4.1.5-2.

4.4.1.5 Test requirement

Tables 4.4.1.4.1-1, 4.4.1.5-1 and 4.4.1.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM cell re-selection test case.

Table 4.4.1.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
Qrxlevmin	dBm	-140	
N_{oc}	dBm/15 kHz	-99.10	
RSRP	dBm/15 KHz	-89.20	-102.80
$\hat{E}_s/I_{ot}$	dB	9.90	-3.70
$\hat{E}_s/N_{oc}$	dB	9.90	-3.70
$Treselection_{EUTRAN}$	s	0	
Snonintrasearch	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ Note 2	dB	24	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for GSM target cell.			

Table 4.4.1.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90.00	-75.00
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2, and starts to send the RR Channel Request message for location update to Cell 2.

The cell re-selection delay test requirement in this case is expressed as:

Cell re-selection delay = 4 * $T_{measureGSM}$ + T_{BCCH}

$T_{measureGSM}$ = 6.40 s; as specified in TS 36.133 [4] clause 4.2.2.3

T_{BCCH} = 1.9 s; maximum time allowed to read the BCCH data from GSM cell, when being synchronized to a BCCH carrier; as specified in TS 45.008 [15] clause 6.2

The cell re-selection delay shall be less than a total of 27.9 seconds in this test case (note: this gives a total of 26 seconds for the $T_{measureGSM}$ calculation plus 1.9 s for T_{BCCH} but the test allows 27.9 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.4.2 E-UTRAN TDD - GSM cell re-selection

4.4.2.1 Test purpose

To verify that the UE is able to search and measure neighbouring GSM cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM.

4.4.2.3 Minimum conformance requirements

If the $S_{ServingCell}$ of the E-UTRA serving cell (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ then:

- The UE may not search for, or measure GSM cells if the priority of GSM is equal to, or lower than the serving cell.
- The UE shall search for and measure GSM cells if the priority of GSM is higher than the serving cell. The minimum rate at which the UE is required to search for and measure such layers may be reduced in this scenario to maintain UE battery life.

If the $S_{ServingCell}$ of the E-UTRA serving cell is less than or equal to $S_{nonintrasearch}$ then the UE shall measure, according to the measurement rules defined in TS 36.304 [6] at least every $T_{measure,GSM}$ as defined in table 4.2.2.5.3-1 of TS 36.133 [4] clause 4.2.2.5.3:

- If a detailed neighbour cell list is provided, the signal level of the GSM BCCH carrier of each GSM neighbour cell indicated in the measurement control system information of the serving cell; or
- If only BCCH carriers are provided, the signal level of the GSM BCCH carriers indicated in the measurement control system information of the serving cell

If the RSRP of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then the UE shall search for GSM BCCH carrier at least every $T_{higher\_priority\_search}$ where $T_{higher\_priority\_search}$ is described in TS 36.133 [4] clause 4.2.2 as $T_{higher\_priority\_search} = (60 * N_{layers})$ seconds, where the parameter N_{layers} is the total number of configured higher priority carrier frequencies. When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{measure,GSM}$, and the UE shall decode the BSIC of the GSM BCCH carrier. If re-selection to any higher priority cell is not triggered within ($4 * T_{measure\_GSM} + Treselection_{RAT}$) after it has been found in a higher priority search, the UE is not required to continue make measurements of the BCCH carrier to evaluate the ongoing possibility of re-selection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s.

The UE shall maintain a running average of 4 measurements for each GSM BCCH carrier. The measurement samples for each cell shall be as far as possible uniformly distributed over the averaging period.

If continuous GSM measurements are required by the measurement rules in TS 36.304 [6], the UE shall attempt to verify the BSIC at least every 30 seconds for each of the 4 strongest GSM BCCH carriers. If a change of BSIC is detected for one GSM cell then that GSM BCCH carrier shall be treated as a new GSM neighbour cell. If the UE detects on a BCCH carrier a BSIC which is indicated as not allowed for that carrier in the measurement control system information of the serving cell, the UE is not required to perform BSIC re-confirmation for that cell.

The UE shall not consider the GSM BCCH carrier in cell re-selection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell re-selection, if it is indicated as not allowed in the measurement control system information of the serving cell.

The normative reference for this requirement is TS 36.133 [4] clause 4.2.2.5.3 and A.4.4.2.

4.4.2.4 Test description

4.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1. 2.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 4.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 4.4.2.4.3.

5. There is one E-UTRA TDD cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.4.2.4.1-1: General test parameters for E-UTRA TDD GSM cell re-selection test case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1 . Cell 1 is an E-UTRA TDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA RF Channel Number			1	1 E-UTRA TDD carrier frequency
GSM ARFCN			1	
Monitored GSM cell list size			12 GSM neighbours including ARFCN 1	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration for cell 1			6	As specified in table 4.2.1 in TS 36.211
PRACH configuration for cell 1			4	As specified in table 5.7.1-2 in TS 36.211
CP length of cell 1			Normal	
Access Barring Information			Not Sent	No additional delays in random access procedure.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
Propagation channel			AWGN	
T1		s	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.

4.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one E-UTRA TDD carrier and twelve GSM cells. In the test there are two successive time periods, with time duration of T1 and T2 respectively. Cell 1 and Cell 2 belong to different tracking areas. By the end of T1, the UE has identified BSIC on the GSM BCCH carrier of Cell 2 but the signal levels do not meet the re-selection criterion. At the start of T2, the signal levels change such that Cell 2 meets the re-selection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA TDD layer.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.

2. Set the parameters according to T1 in Table's 4.4.2.5-1 and 4.4.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 4.4.2.5-1 and 4.4.2.5-2.

4. The SS waits for random access requests information from the UE to perform cell re-selection on Cell 2.

5. If the UE responds on Cell 2 during time duration T2 within [28 seconds] from the beginning of time period T2 then the num ber of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

6. Repeat step 1-5 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.4.2.4.3 Message contents

Message contents are according to TS 36.508 [4] clause 4.6 with the following exceptions:

Table 4.4.2.4.3-1: Common Exception messages for E-UTRAN TDD - GSM cell re-selection test case

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-9 Table H.2.3-10
Default RRC messages and information elements contents exceptions	Table H.3.2-2

4.4.2.5 Test requirement

Tables 4.4.2.4.1-1, 4.4.2.5-1 and 4.4.2.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM cell re-selection test case.

Table 4.4.2.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.2 (OP.2 TDD)		OP.2 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$Q_{rxlevmin}$	dBm	-140	
N_{oc}	dBm/15 kHz	-99.10	
RSRP	dBm/15 KHz	-89.20	-102.80
$\hat{E}_s/I_{ot}$	dB	9.90	-3.70
$\hat{E}_s/N_{oc}$	dB	9.90	-3.70
$T_{reselectionEUTRAN}$	s	0	
$S_{nonintrasearch}$	dB	Not sent	
$Thresh_{serving, low}$	dB	44	
$Thresh_{x, low}$ (Note 2)	dB	24	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: This refers to $Thresh_{x, low}$ which is included in E-UTRA system information, and is a threshold for GSM target cell.			

Table 4.4. 2.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90.00	-75.00
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

The cell re-selection delay is defined as the time from the beginning of time period T2, to the moment when the UE camps on Cell 2.

The cell re-selection delay test requirement in this case is expressed as:

Cell re-selection delay = 4 * TmeasureGSM + TBCCH

TmeasureGSM = 6.4 s; as specified in TS 36.133 [4] clause 4.2.2.5

TBCCH = 1.9 s; as specified in TS 45.008 [15] clause 6.2

The cell re-selection delay shall be less than a total of [28 seconds] in this test case (note: this gives a total of 27.5 seconds but the test allows 28 seconds).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.5 E-UTRAN to HRPD Cell Re-Selection

4.5.1 E-UTRAN FDD - HRPD Cell re-selection

4.5.1.1 E-UTRAN FDD - HRPD Cell Reselection: HRPD is of Lower Priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The intra-frequency cell reselection criteria related to scaling of measurement rules parameters need to be specified when parameters are finalized*
- *The intra-frequency cell reselection criteria related to exact scaling parameters for different mobility states are undefined*
- *Measurement bandwidth (current assumption is 6RB) is undefined*
- *The "out of service" criteria is undefined*
- *The transmission scheme (1Tx or 2Tx) undefined*
- *The Message contents are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *Test tolerances have not yet been applied to the wanted and interfering signal levels*

4.5.1.1.1 Test purpose

To verify that the UE is able to search and measure neighboring HRPD cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements.

4.5.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD

4.5.1.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to HRPD cell, the UE shall acquire the timing of HRPD cells.

When the measurement rules indicate that HRPD cells are to be measured, the UE shall measure CDMA2000 HRPD Pilot Strength of HRPD cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of HRPD Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all HRPD cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'HRPD Start Measuring E-UTRAN Rx Power Strength Threshold' and HRPD is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure CDMA2000 HRPD Pilot Strength of the HRPD cells at least every (Number of HRPD Neighbour Frequency)*$T_{measureHRPD}$. In case HRPD is of higher priority than the currently selected E-UTRAN frequency layer the UE shall measure HRPD cells at least every (Number of HRPD Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the HRPD cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateHRPD}$.

Table 4.2.2.5.4-1 of TS 36.133 [4] clause 4.2.2.5.4 gives values of $T_{measureHRPD}$ and $T_{evaluateHRPD}$

4.5.1.1.4 Test description

4.5.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] Clause 4.3.1.1.

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure A.14
2. The general test parameter settings are set up according to Table 4.5.1.1.4.1-1..
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 4.5.1.1.4.3
5. There is one E-UTRA FDD cell and one HRPD cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table4.5.1.1.4.1-1: General Test Parameters for E-UTRAN FDD - lower priority HRPD Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA FDD RF Channel Number			1	Only one FDD carrier frequency is used.
E-UTRA FDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.5.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one HRPD cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN FDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table's 4.5.1.1.5-1 and 4.5.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 4.5.1.1.5-1 and 4.5.1.1.5-2.
4. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 1-5 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.5.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 4.5.1.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.3-11 Table H.2.3-12
Default RRC messages and information elements contents exceptions	Table H.3.2-1

4.5.1.1.5 Test requirement

Tables 4.5.1.1.5-1 and 4.5.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD cell re-selection test (HRPD cell is of lower priority).

Table 4.5.1.1.5-1: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 KHz	-89 + TT	-100+ TT
$\hat{E}_s/I_{ot}$	dB	9+ TT	-2+ TT
$\hat{E}_s/N_{oc}$	dB	9+TT	-2+TT
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51	40
$Thresh_{serving, low}$	dB	43	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table A.4.5.1.1.1-3: Cell Specific Test Parameters for HRPD (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
HRPD RF Channel Number		1	
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	0 + TT	0 + TT
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3 + TT	-3 + TT
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		-6	
Treselection	s	0	
hrpd-CellReselectionPriority	-	0	
$Thresh_{x,\ low}$		-14	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluateHRPD} + T_{SI\text{-}HRPD}$

Where:

$T_{evaluatHRPD}$ 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.4-1

$T_{SI\text{-}HRPD}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

4.6 E-UTRAN to cdma2000 1xRTT Cell Re-Selection

4.6.1 E-UTRAN FDD - cdma2000 1xRTT Cell re-selection

4.6.1.1 E-UTRAN FDD - cdma2000 1x Cell Reselection: cdma2000 1X is of Lower Priority

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The intra-frequency cell reselection criteria related to scaling of measurement rules parameters need to be specified when parameters are finalized*
- *The intra-frequency cell reselection criteria related to exact scaling parameters for different mobility states are undefined*
- *Measurement bandwidth (current assumption is 6RB) is undefined*
- *The "out of service" criteria is undefined*
- *The transmission scheme (1Tx or 2Tx) undefined*
- *The Message contents are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *Test tolerances have not yet been applied to the wanted and interfering signal levels*

4.6.1.1.1 Test purpose

To verify that the UE is able to search and measure neighboring cdma2000 1xRTT cells and compare to the E-UTRA serving cell to meet the inter-RAT cell re-selection requirements when the cdma2000 1x is of lower priority.

4.6.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT.

4.6.1.1.3 Minimum conformance requirements

In order to perform measurement and cell reselection to cdma2000 1X cell, the UE shall acquire the timing of cdma2000 1X cells.

When the measurement rules indicate that cdma2000 1X cells are to be measured, the UE shall measure cdma2000 1x RTT Pilot Strength of cdma2000 1X cells in the neighbour cell list at the minimum measurement rate specified in this section.

The parameter 'Number of CDMA2000 1X Neighbour Frequency', which is transmitted on E-UTRAN BCCH, is the number of carriers used for all cdma2000 1X cells in the neighbour cell list.

When the RSRP of the E-UTRA serving cell (or other cells on the same frequency layer) is lower than 'CDMA2000 1X Start Measuring E-UTRAN Rx Power Strength Threshold' and cdma2000 1X is of lower priority than the currently selected E-UTRAN frequency layer, the UE shall measure Pilot Ec/Io of the CDMA2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)*$T_{measureCDMA2000\ 1X}$. In case cdma2000 1X is of higher priority than the currently selected E-UTRAN frequency layer, the UE shall measure cdma2000 1X cells at least every (Number of CDMA2000 1X Neighbour Frequency)* $T_{higher\_proirty\_search}T_{higher\_priority\_measure}$. The parameter $T_{higher\_proirty\_search}$ $T_{higher\_priority\_measure}$ is defined in section 4.2.2 of TS 36.133 [4].

The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in TS 36.304 [6] within $T_{evaluateCDMA2000\ 1X}$.

Table 4.2.2.5.5-1 of TS 36.133 [4] clause 4.2.2.5.5 gives values of $T_{measureCDMA2000\ 1X}$ and $T_{evaluateCDMA2000\ 1X}$.

4.6.1.1.4 Test description

4.6.1.1.4.1 Initial conditions

Test Environment: Normal as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] Clause 4.3.1.1.

1. Connect the SS (nodeB emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14
2. The general test parameter settings are set up according to Table 4.6.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0..
4. Message contents are as defined in clause 4.6.1.1.4.3
5. There is one E-UTRA FDD cell and one CDMA2000 1xRTT cell specified in the test. Cell 1(E-UTRA FDD cell) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 4.6.1.1.4.1-1: General Test Parameters for E-UTRAN FDD - lower priority cdma2000 1X Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		s	1.28	
E-UTRA FDD RF Channel Number			1	Only one FDD carrier frequency is used.
E-UTRA FDD Channel Bandwidth ($BW_{channel}$)		MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		s	30	
T2		s	30	

4.6.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The UE is requested to monitor the neighbouring cell on one CDMA200 1xRTT cell. In the test there are two successive time periods, with time duration of T1 and T2 respectively.

Both E-UTRAN FDD cell 1 and CDMA2000 1xRTT cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell2 is of lower priority than cell 1. Cell 1 and Cell 2 belong to different tracking areas.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to T1 in Table's 4.6.1.1.5-1 and 4.6.1.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 4.6.1.1.5-1 and 4.6.1.1.5-2.
4. The SS waits for location update information from the UE to perform cell re-selection on Cell 2.
5. If the UE responds on Cell 2 during time duration T2 within 21 seconds from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
6. Repeat step 1-5 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

4.6.1.1.4.3 Message contents

Message contents are according to [clause FFS in reference FFS].

4.6.1.1.5 Test requirements

Tables 4.6.1.1.5-1 and 4.6.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT cell re-selection test (cdma2000 1x cell is of lower priority).

Table 4.6.1.1.5-1: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.2 (OP.2 FDD)		OP.2 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 KHz	-89+ TT	-100+ TT
$\hat{E}_s/I_{ot}$	dB	9+ TT	-2+ TT
$\hat{E}_s/N_{oc}$	dB	9	-2
$Treselection_{EUTRAN}$	S	0	
Snonintrasearch	dB	Not sent	
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-140	
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
$S_{ServingCell}$	dB	51	40
$Thresh_{serving, low}$	dB	43	
Propagation Condition		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 4.6.1.1.5-2: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

Parameter	Unit	Cell 2	
		T1	T2
cdma2000 1X RF Channel Number		1	
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	[-7]	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	[-16]	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	[-12]	
$\hat{I}_{or}/I_{oc}$	dB	[0] + TT	[0] + TT
I_{oc}	dBm/ 1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	[-10] + TT	[-10] + TT
Propagation Condition		AWGN	
$S_{nonServingCell,x}$		[-20]	
Treselection	s	0	
oneXRTT-CellReselectionPriority	-	0	
$Thresh_{x, low}$		[-28]	

The cell reselection delay to lower priority is defined as the time from the beginning of time period T2, to the moment when the UE camps on cell 2 and starts to send access probe preambles on the Access Channel on cell 2.

The cell re-selection delay to the lower priority cell 2 shall be less than 21 s.

The cell re-selection delay to lower priority cell can be expressed as: $T_{evaluatecdma2000\ 1X} + T_{SI\text{-}cdma2000\ 1X}$

Where:

$T_{evaluatcdma2000\ 1X}$ = 19.2 s for 1.28 s DRX cycle as specified in TS 36.133 [4] Clause 4.2.2.5 Table 4.2.2.5.5-1

$T_{SI\text{-}cdma2000\ 1X}$ Maximum repetition period of relevant system information blocks that need to be received by the UE to camp on cell 2; 1280 ms is assumed in this test case.

This gives a total of 20.48 s for the lower priority cell reselection, allow 21 s in the test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5 E-UTRAN RRC_CONNECTED State Mobility

When the UE is in RRC_CONNECTED state on a cell, network-controlled UE-assisted handovers are performed. The UE makes measurements of attributes of the serving and neighbour cells to enable the handover process. This process allows the UE to transfer a connection between the UE and current cell to target cell.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Due to the undefined UE behaviour regarding the sending of HARQ-ACK after receiving a RRC message triggering an handover (acc. 3GPP TS 36.331 [5] Subclause 5.3.5.4), the SS behaviour when waiting for the appropriate HARQ acknowledgement should be as follows:

- Reception of an HARQ-ACK will cause no HARQ delay exclusion (acc. subclause 3A.1).
- Reception of an HARQ-NACK will cause HARQ retransmission and HARQ delay exclusion (acc. subclause 3A.1).
- UE-DTX (as observed by SS) will cause HARQ retransmission, but no HARQ delay exclusion (acc. subclause 3A.1).

Uplink for E-UTRA cell(s) is configured according to Annex A.3.

5.1 E-UTRAN Handover

5.1.1 E-UTRAN FDD-FDD Handover intra frequency case

5.1.1.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

5.1.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.1 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.1

5.1.1.4 Test description

5.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211[9]
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power setting from T2 to T3 as specified in Table 5.1.1.1.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE . Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-1

Table 5.1.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.1.4.3-3: MeasResults: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCellsCHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 5.1.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdEUTRA		
trackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult			
rsrpResult	Not present		
rsrqResult	Not present		
…			
}			
}			

5.1.1.5 Test requirement

Tables 5.1.1.4.1-1 and 5.1.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra frequency handover test case.

Table 5.1.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt}$ = T_{search} + T_{IU} + 20 ms

T_{search} = 0, since Cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.2 E-UTRAN TDD-TDD Handover intra frequency case

5.1.2.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an intra-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

5.1.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When intra-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.2.2 for intra-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.2.

5.1.2.4 Test description

5.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.2.4.3.

5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.2.4.1-1: General Test Parameters for E-UTRAN TDD/TDD Intra Frequency Handover case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in Annex A.1.2
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in Annex A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		μs	3	Synchronous cells 3μs or 92*Ts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3.

7. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC Connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.2.1.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than [45 ms] from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.2-2

Table 5.1.2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.2.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
measResult			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
…			
}			
}			

Table 5.1.2.4.3-5: *RRCConnectionReconfiguration*: E-UTRAN Measurement Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
Rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
C1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
MobilityControlInfo			
	MobilityControlInfo-HO		HO

5.1.2.5 Test requirement

Tables 5.1.2.4.1-1 and 5.1.2.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Intra Frequency Handover test.

Table 5.1.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD/TDD Intra Frequency Handover case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in TS 36.133 [4] A.3.2.1.1 (OP.1 TDD) and in A.3.2.1.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note]	dB						
OCNG_RB[Note]	dB						
$\hat{E}_s/I_{ot}$	dB	8	-3.8	-3.8	-Infinity	2.86	2.86
N_{oc}	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11.5	11.5
RSRP	dBm/15 KHz	-90	-90	-90	- Infinity	-86.5	-86.5
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T^{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since cell 2 is known prior to the test

$T_{IU} = 15$ ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.3 E-UTRAN FDD-FDD Handover inter frequency case

5.1.3.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

5.1.3.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

> $D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

> T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.
>
> T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.1 for inter-frequency handover.

Inter-frequency measurement requirements rely on the UE being configured with one measurement gap pattern. UEs shall only support those measurement gap patterns listed in TS 36.133 [4] Table 8.1.2.1-1 that are relevant to its measurement capabilities.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.2.1.

5.1.3.4 Test description

5.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 5.1.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.1.3.4.3.

5. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			1	As specified in 3GPP TS 36.133[4] section 8.1.2.1.
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		Ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in Table 5.1.3.5-2
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells		3	ms	Asynchronous cells 3ms or 92160*Ts
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1 in 3GPP TS 36.133 [4] started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

5.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.3.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.3.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 5.1.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-1 Table H.3.6-2

Table 5.1.3.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.3.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 5.1.3.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdEUTRA		
trackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult			
rsrpResult	Not present		
rsrqResult	Not present		
…			
}			
}			

5.1.3.5 Test requirement

Tables 5.1.3.4.1-1, 5.1.3.5-1, and 5.1.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover test case.

Table 5.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7.10	7.10
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7.10	7.10
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-90.9	-90.9
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 5.1.3.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD inter frequency handover test case

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	sf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{search} + T_{IU} + 20$ ms

$T_{search} = 0$, since Cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 35 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.4 E-UTRAN TDD-TDD Handover inter frequency case

5.1.4.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

5.1.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover, the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.4 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.4

5.1.4.4 Test description

5.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 5.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.4.4.3.
5. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.4.4.1-1: General Test Parameters for E-UTRAN TDD-TDD inter frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in clause A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in clause A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two TDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		Ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in Table 5.1.4.5-2
PRACH configuration			53	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information		-	Not sent	No additional delays in random access procedure
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
Time offset between cells		μs	3	Synchronous cells 3μs or 92*Ts
Gap pattern configuration Id			1	As specified in Table 8.1.2.1-1 in 3GPP TS 36.133 [4] started before T2 starts
T1		s	5	
T2		s	≤5	
T3		s	1	

Table 5.1.4.4.1-2: Void

5.1.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The start of T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 5.1.4.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 5.1.4.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3.
7. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.1.3.5-1.
9. The UE shall transmit RRCConnectionReconfigurationComplete message.
10. If the UE transmits the uplink PRACH channel to Cell 2 less than 50 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
11. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
12. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
13. Repeat step 2-12 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.4.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter-frequency handover test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-3 Table H.3.1-7 Table H.3.2-2 Table H.3.6-2

Table 5.1.4.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-8 (-4 dB)	-4 is actual value in dB (-8 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 5.1.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 5.1.4.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency handover test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of the Cell 2		
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdEUTRA		
trackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 5.1.4.4.3-5: *RRCConnectionReconfiguration*: E-UTRAN Measurement Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
Rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
C1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
MobilityControlInfo			
	MobilityControlInfo-HO		HO

5.1.4.5 Test requirement

Tables 5.1.4.4.1-1 and 5.1.4.5-1 define the primary level settings including test tolerances for E-UTRAN TDD/TDD Inter Frequency Handover test.

Table 5.1.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD/TDD Inter Frequency Handover case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in TS 36.133 [4] A.3.2.1.1 (OP.1 TDD) and in A.3.2.1.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note]	dB						
OCNG_RB[Note]	dB						
$\hat{E}_s/I_{ot}$	dB	4	4	4	-Infinity	7.10	7.10
N_{oc}	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7.10	7.10
RSRP	dBm/15 KHz	-94	-94	-94	- Infinity	-90.9	-90.9
Propagation Condition		AWGN					
Note: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							

Table 5.1.4.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD inter frequency handover test case

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	sf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T^{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is 35 ms expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms

T_{search} = 0, since cell 2 is known prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ shall be less than a total of 50 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.5 E-UTRAN FDD-FDD inter frequency Handover: unknown target cell

5.1.5.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when an inter-frequency handover: unknown target cell is commanded by meeting the handover to an unknown target cell delay requirements.

5.1.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

5.1.5.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.1.2.1.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$. The $T_{interrupt}$ equation is defined as:

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in the new cell. T_{IU} can be up to 30 ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is know if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.1 for inter-frequency handover.

Inter-frequency measurement requirements rely on the UE being configured with one measurement gap pattern. UEs shall only support those measurement gap patterns listed in TS 36.133 [4] Table 8.1.2.1-1 that are relevant to its measurement capabilities.

The normative reference for this requirement is TS 36.133 [4] clause 5.1.2.1 and A.5.1.5.

5.1.5.4 Test description

5.1.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 5.1.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.5.4.3.
5. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.5.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channel number			1, 2	Two FDD carriers are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
PRACH configuration			4	As specified in table 5.7.1-2 in 3GPP TS 36.211 [9]
Access Barring Information		-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
T1		s	≤5	
T2		s	1	

5.1.5.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.5.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfigurationmessage implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.1.5.5-1. T2 starts.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. If the UE transmits the uplink PRACH channel to Cell 2 less than 130 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell..

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.5.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 5.1.5.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 5.1.5.4.3-2: *RRCConectionReconfiguration*: Additional E-UTRAN FDD-FDD inter frequency handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
mobilityControlInfo	MobilityControlInfo-HO		HO
}			
}			
}			
}			

5.1.5.5 Test requirement

Tables 5.1.5.4.1-1 and 5.1.5.5-1define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test.

Table 5.1.5.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD inter frequency handover: unknown target cell test case

Parameter	Unit	Cell 1		Cell 2	
		T1	**T2**	**T1**	**T2**
E-UTRA RF Channel number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
N_{oc} Note 2	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-91
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$ (note: the target cell is unknown)

$T_{interrupt}$ = T_{search} + T_{IU} + 20 ms

T_{search} = 80, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

Maximum RRC procedure delay = 15 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.1.6 E-UTRAN TDD-TDD inter frequency handover: unknown target cell

5.1.6.1 Test purpose

To verify the UE's ability to perform handover in RRC_CONNECTED state when the target cell is unknown and an inter-frequency handover is commanded by meeting the UE maximum RRC procedure delay and interruption time requirements.

5.1.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

5.1.6.3 Minimum conformance requirements

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [2].

When the UE receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink PRACH channel within $D_{handover}$ seconds from the end of the last TTI containing the RRC command.

Where:

$D_{handover}$ equals the maximum RRC procedure delay defined in TS 36.331 [5] clause 11.2 plus the interruption time stated in TS 36.133 [4] clause 5.2.2.4.2.

The interruption time is the time between end of the last TTI containing the RRC command on the old PDSCH and the time the UE starts transmission of the new PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new PRACH.

When inter-frequency handover is commanded, the interruption time shall be less than $T_{interrupt}$.

$$T_{interrupt} = T_{search} + T_{IU} + 20 \text{ ms}$$

Where:

T_{search} is the time required to search the target cell when the target cell is not already known when the handover command is received by the UE. If the target cell is known, then T_{search} = 0 ms. If the target cell is unknown and signal quality is sufficient for successful cell detection on the first attempt, then T_{search} = 80 ms. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell search times.

T_{IU} is the interruption uncertainty in acquiring the first available PRACH occasion in new cell. T_{IU} can be up to 30ms.

NOTE: The actual value of T_{IU} shall depend upon the PRACH configuration used in the target cell.

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in TS 36.133 [4] clause 8.1.2.3.4 for inter-frequency handover.

The normative reference for this requirement is TS 36.133 [4] clause 5.2.2.4 and A.5.1.4

5.1.6.4 Test description

5.1.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 5.1.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.1.6.4.3.
5. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.1.6.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.2.1
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1, 2	Two TDD carriers
DRX			OFF	Non-DRX test
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
Gap pattern configuration			-	No gap pattern configured
T1		s	≤5	
T2		s	1	

5.1.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.1.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC connection reconfiguration message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.1.6.5-1. T2 starts.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. If the UE transmits the uplink PRACH channel to Cell 2 less than 130 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.

7. After T2 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. Repeat step 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.1.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.1.6.4.3-1: Common Exception messages for E-UTRAN TDD-TDD inter frequency handover unknown target cell test requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 5.1.6.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD-TDD inter frequency handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
Rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
C1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
mobilityControlInfo	MobilityControlInfo-HO		HO
}			
}			
}			
}			

5.1.6.5 Test requirement

Tables 5.1.6.4.1-1 and 5.1.6.5-1 define the primary level settings including test tolerances for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown.

Table 5.1.6.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in TS 36.133[4] A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	5
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	5
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T^{interrupt}$

The maximum RRC procedure delay test requirement in this case is 15ms, as specified in TS 36.331 [5] clause 11.2.

The $T_{interrupt}$ test requirement in this case is expressed as:

$T_{interrupt} = T_{search} + T_{IU}$ + 20 ms (note: the target cell is unknown)

T_{search} = 80 ms, since Cell 2 is unknown prior to the test

T_{IU} = 15 ms, since 10 ms due to uncertainty in frame and 5 ms additional delay due to PRACH transmission occasion

The handover delay $D_{handover}$ to an unknown target cell shall be less than a total of 130 ms in this test case (note: this gives a total of 15 ms for maximum RRC procedure delay plus 115 ms for $T_{interrupt}$) .

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2 Handover from E-UTRAN to other RATs

5.2.1 E-UTRAN FDD - UTRAN FDD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.1.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

5.2.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$. The $T_{interrupt1}$ equation is defined as:

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$. The $T_{interrupt2}$ equation is defined as:

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

The phase reference is the UTRA primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one “in_sync” is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.1.

5.2.1.4 Test description

5.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.1.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.1.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
b2-Threshold1		dBm	-91	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	Absolute UTRAN CPICH Ec/N0 threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		s	5	
T2		s	≤5	
T3		s	1	

5.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.1.5-1 and 5.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.1.5-1 and 5.2.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.1.5-1 and 5.2.1.5-2.

9. If the UE transmits the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. .Cell 1 is the active cell.

11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 and 4.7B with the following exceptions:

Table 5.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.1.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	49(-91 dBm)	-91 dBm EUTRA-Thres is actual threshold value in dBm (49 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18 dB)	-18 dB is actual UTRA-Thres is actual Ec/NOEcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
timeToTrigger	ms0		
}			
}			
maxReportCells	6		
reportInterval	ms1024		
reportAmount	Infinity		
}			

Table 5.2.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
lcoatonAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.1.4.3-5: *PhysCellIdentityUTRA-FDD*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysCellIdUTRA-FDD ::= SEQUENCE {	250	This is the typical value range used in UTRAN FDD tests.	

Table 5.2.1.4.3-6: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark
Downlink information common for all radio links - Downlink DPCH info common for all RL - Timing indicator - Default DPCH Offset Value	 Initialize Arbitrary set to value 0..306688 by step of 512

5.2.1.5 Test requirement

Tables 5.2.1.4.1-1, 5.2.1.5-1 and 5.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover test.

Table 5.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD to UTRAN FDD handover test case (Cell 1)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note]	dB			
OCNG_RB[Note]	dB			
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT	0 + TT
$\hat{E}_s/N_{oc}$		0 + TT	0 + TT	0 + TT
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-98 + TT	-98 + TT	-98 + TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.1.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD cell

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
DCH_Ec/Ior	dB	N/A	N/A	Note 1
OCNS_Ec/Ior	dB	-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8 + TT	-1.8 + TT
I_{oc}	dBm/3,84 MHz	-70	-70	-70
CPICH_Ec/Io	dB	-infinity	-14 + TT	-14 + TT
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt1}$ (note: the target cell is known)

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 190 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 140 ms for $T_{interrupt1}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.2 E-UTRAN TDD - UTRAN FDD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.2.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD.

5.2.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$. The $T_{interrupt1}$ equation is defined as:

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$. The $T_{interrupt2}$ equation is defined as:

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

The phase reference is the UTRA primary CPICH.

The requirements assume that N312 has the smallest possible value i.e. only one “in_sync” is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.2.

5.2.2.4 Test description

5.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for call setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.2.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD handover

Parameter		Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
	Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Final conditions	Active cell		Cell 2	
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1
E-UTRAN TDD measurement quantity			RSRP	
Inter-RAT (UTRA FDD) measurement quantity			CPICH Ec/Io	
b2-Threshold1		dBm	-91	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-UTRA		dB	-18	UTRAN FDD CPICH Ec/Io threshold for event B2
Hysteresis		dB	0	
DRX			OFF	No DRX configured.
Time to Trigger		Ms	0	
Filter coefficient			0	
CP length			Normal	Applicable to cell 1
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell list before T2.
Post-verification period			False	Post verification is not used.
T1		s	5	
T2		s	≤5	
T3		s	1	

5.2.2.4.2 Test procedure

The test consists of one E-UTRAN TDD cell and one neighbour UTRAN FDD cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A neighbouring cell list, including the UTRA cell (Cell 2) is sent to the UE before T2 starts. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 5.2.2.5-1 and 5.2.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.2.5-1 and 5.2.2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.2.5-1 and 5.2.2.5-2.
9. If the UE transmits the Uplink DPCCH channel to Cell 2 less than [190 ms] from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
11. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100) for next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

5.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.2.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN FDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.2.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)-			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
Threshold-RSRP	49 (-91dBm)	-91 dBm EUTRA-Thres is actual threshold value in dBm (49 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18dB)	-18 dB is actual UTRA-Thres is actual Ec/NOo value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
timeToTrigger	ms0		
}			
}			
maxReportCells	6		
reportInterval	ms1024		
reportAmount	infinity		
}			

Table 5.2.2.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.2.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
lcoatonAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.2.4.3-5: *PhysCellIdentityUTRA-FDD*: Additional E-UTRAN TDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysCellIdUTRA-FDD ::= SEQUENCE {	250	This is the typical value range used in UTRAN FDD tests.	

5.2.2.5 Test requirement

Tables 5.2.2.4.1-1, 5.2.2.5-1 and 5.2.2.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD handover test.

Table 5.2.2.5-1: Cell specific test parameters for E-UTRAN TDD (cell 1) for handover to UTRAN FDD (cell # 2)

Parameter	Unit	Cell 1 (E-UTRAN)		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.1 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA[Note]				
OCNG_RB[Note]				

RSRP	dBm/15 kHz	-98+TT	-98+TT	-98+TT
$\hat{E}_s/I_{oc}$	dB	0+TT	0+TT	0+TT
$\hat{E}_s/N_{oc}$	dB	0+TT	0+TT	0+TT
N_{oc}	dBm/15 kHz	-98		
Propagation Condition		AWGN		
Note: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.2.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Cell 2 (UTRA)		
		T1	T2	T3
CPICH_Ec/Ior	dB	-10		
PCCPCH_Ec/Ior	dB	-12		
SCH_Ec/Ior	dB	-12		
PICH_Ec/Ior	dB	-15		
DPCH_Ec/Ior	dB	N/A	N/A	Note 1
OCNS	dB	-0.941	-0.941	Note 2
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8+TT	-1.8+TT
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io	dB	-infinity	-14+TT	-14+TT
Propagation Condition		AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.				

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrup1t}$(note: the target cell is known)

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 190 ms in this test case (note: this gives a total of 50ms for maximum RRC procedure delay plus 140 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.3 E-UTRAN FDD - GSM handover

5.2.3.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM in RRC_CONNECTED state by meeting the UE handover delay and interruption time requirements.

5.2.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM.

5.2.3.3 Minimum conformance requirements

The handover delay $T_{Handover\ delay}$ shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.3.3-1 and interruption time given in table 5.2.3.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.3.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-2.

Table 5.2.3.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.3.

5.2.3.4 Test description

5.2.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.3.4.3.
5. There is one E-UTRA FDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.3.4.1-1: General Test Parameters for E-UTRAN FDD - GSM handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id			1	As specified in TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Inter-RAT measurement quantity			GSM Carrier RSSI	
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
T1		s	20	
T2		s	7	
T3		s	1	

5.2.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. The RRC message implying handover to Cell 2 shall be sent to the UE during T2, after the UE has reported Event B1. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover. The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern is sent.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.3.5-1 and 5.2.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.3.5-1 and 5.2.3.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.3.5-2. T3 starts.
9. If the UE sends access bursts on the new DCCH to Cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
11. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.3.4.3-1: Common Exception messages for E-UTRAN FDD - GSM handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.3.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.3.4.3-3: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f13		
measObject CHOICE {			
MeasObjectGERAN	MeasObjectGERAN-GENERIC(f13)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f13		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 5.2.3.4.3-4: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-Threshold-GERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	

Table 5.2.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.3.4.3-6: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
Cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdGERAN		
routingAreaCode	Not present		
}			
measResult SEQUENCE {			
Rssi		Set according to specific test	
}			
}			

5.2.3.5 Test requirement

Tables 5.2.3.4.1-1, 5.2.3.5-1 and 5.2.3.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM handover test case.

Table 5.2.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1	
		T1, T2	T3
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s/I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)	
$\hat{E}_s/N_{oc}$	dB	4	
RSRP Note 3	dBm/15kHz	-94	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.2.3.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{\text{Handover delay}}$ test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 90 ms; this is based on handover delay value as defined in Table 5.2.3.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{Handover\ delay}$ shall be less than a total of 100 ms in this test case (note: this gives a total of 99.29 ms but the test allows 100 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.4 E-UTRAN TDD - UTRAN TDD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

-
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.4.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

5.2.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure performance value plus the interruption time stated in TS 36.133 [4] section 5.3.2.2.

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the E-UTRAN PDCCH and the time the UE starts transmission of the new uplink DPCH or the SYNC-UL, is dependent on whether the target cell is known for the UE or not. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max}$ ms

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$T_{interrupt2}= T_{offset}+T_{UL}+30*F_{SFN}+180 +10*F_{max}$ ms

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.4.

5.2.4.4 Test description

5.2.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

2. The general test parameter settings are set up according to Table 5.2.4.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.2.4.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.4.4.1-1: General test parameters for E-UTRA TDD to UTRA (1.28 Mcps TDD OPTION) handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions	Active cell		Cell 1	E-UTRA TDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells 3ms or 92160*Ts
Access Barring Information			Not Sent	No additional delays in random access procedure.
Hysteresis		dB	0	
Time To Trigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Hys		dB	0	
Thresh1		dBm	-94	E-UTRA event B2 threshold
Thresh2		dBm	-79	UTRA event B2 threshold
T1		s	5	
T2		s	≤10	
T3		s	1	

5.2.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A neighbouring cell list, including the UTRA cell (Cell 2) is sent to the UE before T2 starts. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.4.5-1 and 5.2.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.4.5-1 and 5.2.4.5-2. T2 starts.
4. UE shall transmit a MeasurementReport message triggered by Event B2.
5. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
6. The start of T3 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.4.5-1 and 5.2.4.5-2. T3 starts.
7. If the UE transmits the UL to Cell 2 less than 90 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
8. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

9. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100) for next iteration of the test procedure loop.

10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.4.4.3-1: Common Exception messages for E-UTRA TDD to UTRA TDD cell handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.4.4.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-8 ReportConfigInterRAT-B2(EUTRA-Thres, UTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	46 (-94 dBm)	-94 dBm EUTRA-Thres is actual threshold value in dBm (46 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-RSCP	36 (-79 dB)	-79 dB is actual UTRA-Thres is actual RSCP value in dB (36 - 115 dBm)	
}			
}			
}			
}			
timeToTrigger	ms0		
}			
}			
maxReportCells	6		
reportInterval	ms1024		
reportAmount	Infinity		
}			

Table 5.2.4.4.3-3: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultsNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.4.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
lcoatonAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.4.4.3-5: *PhysCellIdentityUTRA-TDD*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysCellIdUTRA-TDD ::= SEQUENCE {	12	This is the typical value range used in UTRAN TDD tests.	

Table 5.2.4.4.3-6: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark
Downlink information common for all radio links - Downlink DPCH info common for all RL - Timing indicator - Default DPCH Offset Value	 Initialize 0 Integer (0..7)

5.2.4.5 Test requirement

Tables 5.2.4.4.1-1, 5.2.4.5-1 and 5.2.4.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD handover test.

Table 5.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD to UTRA TDD handover test case (Cell 1)

Parameter	Unit	Cell 1		
		T1	T2	T3
E-UTRA RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD
PBCH_RA	dB	0	0	0
PBCH_RB	dB			
PSS_RB	dB			
SSS_RB	dB			
PCFICH_PA	dB			
PHICH_PA	dB			
PHICH_PB	dB			
PDCCH_PA	dB			
PDCCH_PB	dB			
PDSCH_PA	dB			
PDSCH_PB	dB			
OCNG_RA[Note]	dB			
OCNG_RB[Note]	dB			
$\hat{E}_s/I_{ot}$	dB	11+TT	-3+TT	-3+TT
$\hat{E}_s/N_{oc}$	dB	11+TT	-3+TT	-3+TT
N_{oc}	dBm/15kHz	-98		
RSRP	dBm/15kHz	-87+TT	-101+TT	-101+TT
SCH_RP	dBm/15 kHz	-87	-101	-101
Propagation Condition		AWGN		
Note: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.4.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number*		Channel 2					
PCCPCH_Ec/Ior	dB	-3					
DwPCH_Ec/Ior	dB				0		
OCNS_Ec/Ior	dB	-3					
$\hat{I}_{or}/I_{oc}$	dB	-3+TT	11+TT	11+TT	-3+TT	11+TT	11+TT
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86+TT	-72+TT	-72+TT	n.a.		
Propagation Condition		AWGN					
* Note: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the channel to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

$D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max}$ ms

T_{offse}= 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 0; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.133

The handover delay $D_{handover}$ shall be less than a total of 90 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.5 E-UTRAN FDD - UTRAN TDD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.5.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN FDD to UTRAN TDD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.2.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA TDD.

5.2.5.3 Minimum conformance requirements

5.2.5.3.1 3.84Mcps TDD option

Editor's note: FFSEditor's note: FFS

5.2.5.3.2 1.28Mcps TDD option

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.2.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$. The $T_{interrupt1}$ equation is defined as:

$$T_{interrupt1}= T_{offset}+T_{UL}+30*F_{SFN}+20 +10*F_{max} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$. The $T_{interrupt2}$ equation is defined as:

$$T_{interrupt2}= T_{offset}+T_{UL}+30*F_{SFN}+ 180 +10*F_{max} \text{ ms}$$

Where:

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
F_{max}	denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.5.

5.2.5.3.2 7.68 Mcps TDD option

Editor's note: FFS

5.2.5.4 Test description

5.2.5.4.1 3.84Mcps TDD option

Editor's note: FFS

5.2.5.4.2 1.28Mcps TDD option

5.2.5.4.2.1Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.5.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.5.4.3.
5. There is one E-UTRA FDD serving cell and one UTRATDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.5.4.2.1-1: General Test Parameters for E-UTRAN FDD - UTRAN TDD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A. 1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A. 2.1
Initial conditions	Active cell		Cell 1	E-UTRA FDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			1	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN FDD measurement quantity			RSRP	
UTRAN TDD measurement quantity			RSCP	
CP length of cell 1			Normal	
Access Barring Information			Not Sent	No additional delays in random access procedure.
Hysteresis		dB	0	
Time To Trigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Hys		dB	0	
Thresh1		dBm	-94	Absolute E-UTRAN RSRP threshold for event B2
Thresh2		dBm	-79	Absolute UTRAN RSCP threshold for event B2
T1		s	5	
T2		s	≤ 10	
T3		s	1	

5.2.5.4.2.2 Test procedure

The test scenario comprises of two cells, E-UTRA TDD cell1 and UTRA TDD cell2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #1 as specified in TS 36.133 [4] Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.5.5.2-1 and 5.2.5.5.2-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.2.5.5.2.-1 and 5.2.5.5.2-2.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.2.5.5-1 and 5.2.5.5-2.

9. If the UE transmits the UL DPCH Cell 2 less than [90] ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2 . Cell 1 is the active cell.

11. SS shall change set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.5.4.2.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.5.4.2.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-5 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.5.4.2.3-2: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(EUTRA-Thres, UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	46 (-94 dBm)	-94 dBm EUTRA-Thres is actual threshold value in dBm (46 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2UTRA CHOICE {			
utra-RSCP	36 (-79 dBm)	-79 dBm is actual UTRA-Thres is actual RSCP value in dBm (36-115dBm)	
}			
}			
}			
}			
Hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	6		
reportInterval	ms1024		
reportAmount	1		
}			

Table 5.2.5.4.2.3-3: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.5.4.2.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
Tdd	UTRA-TDD-CellIdentity		
}			
cgi-Info SEQUENCE {			
cellGlobalId	GlobalCellId-UTRA		
locationAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test		
}			
}			

5.2.5.4.3 7.68 Mcps TDD option

Editor's note: FFS

5.2.5.5 Test requirement

5.2.5.5.1 3.84Mcps TDD option

Editor's note: FFS

5.2.5.5.2 1.28Mcps TDD option

Tables 5.2.5.4.2.1-1, 5.2.5.5.2-1 and 5.2.5.5.2-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD handover test.

Table 5.2.5.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note 1]	dB			
OCNG_RB[Note 1]	dB			
$\hat{E}_s/N_{oc}$	dB	11 + TT	-3 + TT	-3+ TT
N_{oc}	dBm/15 kHz	-98		
$\hat{E}_s/I_{ot}$	dB	11 + TT	-3 + TT	-3+ TT
RSRP	dBm/15 KHz	-87 + TT	-101 + TT	-101+ TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.				

Table 5.2.5.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number*		Channel 2					
PCCPCH_Ec/Ior	dB	-3					
DwPCH_Ec/Ior	dB				0		
OCNS_Ec/Ior	dB	-3					
$\hat{I}_{or}/I_{oc}$	dB	-3 TT	11 TT	11 TT	-3 TT	11 TT	11 TT
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86 TT	-72 TT	-72 TT	n.a.		
Propagation Condition		AWGN					
* Note: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.							

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the UL DPCH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + 20 + 10*F_{max}$ ms

T_{offse}= 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 0; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover delay $D_{handover}$ shall be less than a total of 90 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.5.5.2 7.68 Mcps TDD option

Editor's note: FFS

5.2.6 E-UTRA TDD - GSM handover

Editor’s note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.6.1 Test purpose

To verify the UE’s ability to transfer a connection between the UE and E-UTRAN to GSM in RRC_CONNECTED state by meeting the UE handover delay and interruption time requirements.

5.2.6.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM.

5.2.6.3 Minimum conformance requirements

The handover delay $T_{Handover}$ delay shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.6.3-1 and interruption time given in table 5.2.6.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.6.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time, i.e. the time between the end of the last TTI containing a transport block on the old channel and the time the UE is ready to transmit on the new channel, shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.3.3-2:

Table 5.2.6.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.3.

5.2.6.4 Test description

5.2.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.6.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.6.4.3.
5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.6.4.1-1: General Test Parameters for E-UTRAN TDD - GSM handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			1	As specified in TS 36.133 [4] section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211 [9]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211 [9]
CP length of cell 1			Normal	
Inter-RAT measurement quantity			GSM Carrier RSSI	
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
$T_{identify,gsm}$		ms	5040	Based on Table 8.1.2.4.5.1.2.1-1 in TS 36.133 [4]
$T_{reconfirm,gsm}$		ms	4800	Based on Table 8.1.2.4.5.1.2.1-1 in TS 36.133 [4]
T1		s	20	
T2		s	5	
T3		s	1	

5.2.6.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. The RRC message implying handover to Cell 2 shall be sent to the UE during T2, after the UE has reported Event B1. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover. The requirements are also applicable for a UE not requiring measurement gap, in which case no measurement gap pattern is sent.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table’s 5.2.6.5-1 and 5.2.6.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table’s 5.2.6.5-1 and 5.2.6.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Table 5.2.6.5-2.

9. If the UE sends access bursts on the new DCCH to Cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2 . Cell 1 is the active cell.

11. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

12. Repeat step 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.6.4.3-1: Common Exception messages for E-UTRAN TDD - GSM handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.6.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.6.4.3-3: MeasurementConfiguration-DEFAULT: Additional E-UTRAN TDD - GSM handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModifyList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	ReportConfigInterRAT-B1-GERAN		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 5.2.6.4.3-4: ReportConfigInterRAT-B1-GERAN: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-Threshold-GERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	

Table 5.2.6.4.3-5: MeasResults: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.6.4.3-6: MeasResultListGERAN: Additional E-UTRAN TDD - GSM handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physicalCellIdentity SEQUENCE {			
Geran-CarrierFreq	GERAN-CarrierFreq	Contains the carrier frequency of the target GERAN cell	
Geran-CellIdentity	GERAN-CellIdentity	Contains the Base Station Identity Code (BSIC) and is used %%	
}			
globalCellIdentity SEQUENCE {			
globalcellID-GERAN	GlobalCellId-GERAN		
rac-Id	Not present		
}			
measResult SEQUENCE {			
Rssi		Set according to specific test	
}			
}			

5.2.6.5 Test requirement

Tables 5.2.6.4.1-1, 5.2.6.5-1 and 5.2.6.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM handover test case.

Table 5.2.6.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1, T2	**T3**
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	
PBCH_ RB	dB		
PSS_ RA	dB		
SSS_ RA	dB		
PCFICH_ RB	dB		
PHICH_ RA	dB		
PHICH_ RB	dB		
PDCCH_ RA	dB		
PDCCH_ RB	dB		
PDSCH_ RA	dB		
PDSCH_ RB	dB		
OCNG_ RA Note	dB		
OCNG_ RB Note	dB		
$\hat{E}_s/I_{ot}$	dB	4 + TT	
N_{oc}	dBm/15 kHz	-98 (AWGN)	
RSRP	dBm/15kHz	-94 + TT	
Propagation Condition		AWGN	
NOTE: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.			

Table 5.2.6.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	**T2, T3**
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85 + TT	-75 + TT

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{Handover\ delay}$ test requirement in this case is expressed as:

Handover delay $T_{Handover\ delay}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 90 ms; this is based on handover delay value as defined in Table 5.2.6.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{Handover\ delay}$ shall be less than a total of 100 ms in this test case (note: this gives a total of 99.3 ms but the test allows 100 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell

5.2.7.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to UTRAN handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.2.7.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

5.2.7.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

> $D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] clause 5.3.1.1.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not. The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$. The $T_{interrupt1}$ equation is defined as:

$$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max} \text{ ms}$$

If the target cell is unknown the interruption time shall be less than $T_{interrupt2}$. The $T_{interrupt2}$ equation is defined as:

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} \text{ ms}$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of T_0 +/- 148 chips.

Where:

T_{IU} is the interruption uncertainty when changing the timing from the E-UTRAN to the new UTRAN cell. T_{IU} can be up to one UTRA frame (10 ms).

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH on the UTRA target cell.

T_{sync} is the time required for measuring the downlink DPCCH channel as stated in TS 25.214 [12] clause 4.3.1.2. In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms.

The phase reference is the UTRA primary CPICH.

The requirements assume that N311 has the smallest possible value i.e. only one "in_sync" is required.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.1 and A.5.2.7.

5.2.7.4 Test description

5.2.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.7.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.7.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.7.4.1-1: General Test Parameters for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
UTRA RF Channel Number			1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size			12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period			False	
T1		s	≤5	
T2		s	1	

5.2.7.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.7.5-1 and 5.2.7.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Tables 5.2.7.5-1 and 5.2.7.5-2. T2 starts.

5. If the UE transmits the UL DPCCH to Cell 2 less than 290 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

7. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.7.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.7.4.3-2: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.7.4.3-3: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
lcoatonAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.7.4.3-4: *PhysCellIdentityUTRA-FDD*: Additional E-UTRAN FDD - UTRAN FDD handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysCellIdUTRA-FDD ::= SEQUENCE {	250	This is the typical value range used in UTRAN FDD tests.	

Table 5.2.7.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark
Downlink information common for all radio links - Downlink DPCH info common for all RL - Timing indicator - Default DPCH Offset Value	 Initialize Arbitrary set to value 0..306688 by step of 512

5.2.7.5 Test requirement

Tables 5.2.7.4.1-1, 5.2.7.5-1 and 5.2.7.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD handover: unknown target cell test.

Table 5.2.7.5-1: Cell Specific Test requirement Parameters for Cell 1 in E-UTRAN FDD - UTRAN FDD handover: unknown target cell test

Parameter	Unit	Cell 1 (E-UTRA)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	0	0
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	0	0
RSRP Note 3	dBm/15 KHz	-98	-98
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.2.7.5-2: Cell Specific Test requirement Parameters for Cell 2 in E-UTRAN - UTRAN FDD handover: unknown target cell test

Parameter	Unit	Cell 2 (UTRA)	
		T1	T2
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DCH_Ec/Ior	dB	Note 1	
OCNS_Ec/Ior	dB	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8
I_{oc}	dBm/3,84 MHz	-70	-70
CPICH_Ec/Io	dB	-infinity	-14
Propagation Condition	AWGN		
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}.			

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the UL DPCCH to Cell 2.

The handover to an unknown target cell delay test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt2}$ (note: the target cell is unknown)

$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max}$ ms

T_{IU} = 10 ms; T_{IU} can be up to one UTRA frame (10 ms).

F_{max} = 4 radio frames; The maximum radio frames within the transmission time intervals to fit into DCCH with 40 ms TTI

T_{sync} = 40 ms; In case higher layers indicate the usage of a post-verification period T_{sync} = 0 ms. Otherwise T_{sync} = 40 ms

Maximum RRC procedure delay = 50 ms as defined in TS 36.331 [5] clause 11.2

The handover to an unknown target cell delay shall be less than a total of 290 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 240 ms for $T_{interrupt2}$).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.8 E-UTRAN FDD - GSM handover: unknown target cell

5.2.8.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to GSM handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.2.8.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM.

5.2.8.3 Minimum conformance requirements

The handover delay $T_{Handover\ delay}$ shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.8.3-1 and interruption time given in table 5.2.8.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.8.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.8.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.8.3-2.

Table 5.2.3.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.8.

5.2.8.4 Test description

5.2.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.8.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 5.2.8.4.3.
5. There is one E-UTRA FDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.8.4.1-1: General Test Parameters for E-UTRAN FDD - GSM handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
T1		s	≤7	
T2		s	1	

5.2.8.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.2.8.5-1 and 5.2.8.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own BSIC, SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.8.5-1 and 5.2.8.5-2. T2 starts.
5. If the UE sends access bursts on the new DCCH to Cell 2 less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
7. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.8.4.3-1: Common Exception messages for E-UTRAN FDD - GSM handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.8.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.8.4.3-3: *MeasResults*: Additional E-UTRAN FDD - GSM handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.8.4.3-4: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdGERAN		
routingAreaCode	Not present		
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

5.2.8.5 Test requirement

Tables 5.2.8.4.1-1, 5.2.8.5-1 and 5.2.8.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM handover: unknown target cell test.

Table 5.2.8.5-1: Cell Specific Test requirement Parameters for Cell 1 in E-UTRAN FDD - GSM handover: unknown target cell test

Parameter	Unit	Cell 1	
		T1	T2
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0	
PBCH_ RB	dB		
PSS_ RA	dB		
SSS_ RA	dB		
PCFICH_ RB	dB		
PHICH_ RA	dB		
PHICH_ RB	dB		
PDCCH_ RA	dB		
PDCCH_ RB	dB		
PDSCH_ RA	dB		
PDSCH_ RB	dB		
OCNG_ RA Note1	dB		
OCNG_ RB Note1	dB		
$\hat{E}_s/I_{ot}$	dB	4	
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4	

RSRP Note 3	dBm/15 kHz	-94
Propagation Condition		AWGN
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 5.2.8.5-2: Cell Specific Test requirement Parameters for Cell 2 in E-UTRAN FDD - GSM handover: unknown target cell test

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover to an unknown target cell delay test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 190 ms; this is based on handover delay value as defined in Table 5.2.3.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover to an unknown target cell delay shall be less than a total of 200 ms in this test case (note: this gives a total of 199.3 ms but the test allows 200 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.9 E-UTRAN TDD - GSM handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.9.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN TDD to GSM in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements when the target cell is unknown.

5.2.9.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM.

5.2.9.3 Minimum conformance requirements

The handover delay $T_{\text{Handover delay}}$ shall be less than handover delay + T_{offset} + T_{UL} in RRC_CONNECTED state.

The handover delay given in table 5.2.9.3-1 and interruption time given in table 5.2.9.3-2 requirements for the case where the UE has not synchronised to the GSM cell before receiving the RRC MOBILITY FROM E-UTRA command are valid when the signal quality of the GSM cell is sufficient for successful synchronisation with one attempt. If the UE is unable to synchronise to the GSM cell on the first attempt, it shall continue to search for synchronisation information for up to 800 ms duration. If after 800 ms the UE has not synchronised to the GSM cell it shall follow the handover failure procedure specified in TS 36.331 [5].

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT within the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.9.3-1 from the end of the last TTI containing the RRC command.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.2.9.3-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	90
The UE has not synchronised to the GSM cell before RRC the MOBILITY FROM E-UTRA COMMAND is received	190

The interruption time is the time between the end of the TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value defined in TS 36.133 [4] clause 5.3.3.2.1 and shown in table 5.2.9.3-2.

Table 5.2.9.3-2: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	40
The UE has not synchronised to the GSM cell before the RRC MOBILITY FROM E-UTRA COMMAND is received	140

The normative reference for this requirement is TS 36.133 [4] clause 5.3.3 and A.5.2.9.

5.2.9.4 Test description

5.2.9.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

2. The general test parameter settings are set up according to Table 5.2.9.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 5.2.9.4.3.

5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.9.4.1-1: General Test Parameters for E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211[8]
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211[8]
T1		s	≤7	
T2		s	1	

5.2.9.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.2.9.5-1 and 5.2.9.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own BSIC, SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, At that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.9.5-1 and 5.2.9.5-2. T2 starts.

5. If the UE sends access bursts on the new DCCH to Cell 2 less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

6 . After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

7. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

8. Repeatstep 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.9.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.9.4.3-1: Common Exception messages for E-UTRAN TDD - GSM handover: unknown target cell test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.3-2 Table H.3.3-3

Table 5.2.9.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM handover: unknown target cell test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 5.2.9.4.3-3: *MeasResults*: Additional E-UTRAN TDD - GSM handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 5.2.9.4.3-4: *MeasResultListGERAN:* Additional E-UTRAN TDD - GSM handover: unknown target cell test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdGERAN		
routingAreaCode	Not present		
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

5.2.9.5 Test requirement

Tables 5.2.9.4.1-1, 5.2.9.5-1 and 5.2.9.5-2 defines the primary level settings including test tolerances for E-UTRAN TDD to GSM handover test case when the target cell is unknown.

Table 5.2.9.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN TDD cell

Parameter	Unit	Cell 1	
		T1	**T2**
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
$\hat{E}_s/I_{ot}$	dB	4+ TT	
N_{oc} Note 2	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4+ TT	

RSRP Note 3	dBm/15 kHz	-94+ TT
Propagation Condition		AWGN
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.		

Table 5.2.9.5-2: Cell Specific Test requirement Parameters for Cell 2 GSM cell

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-Infinity	-75+ TT

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to send access bursts on the new DCCH to Cell 2.

The handover delay $T_{\text{Handover delay}}$ test requirement in this case is expressed as:

Handover delay $T_{\text{Handover delay}}$ = handover delay + T_{offset} + T_{UL}

Handover delay = 190 ms; this is based on handover delay value as defined in Table 5.2.9.3.-1

T_{offset} = 4.65 ms; GSM timing uncertainty between the time from when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL} = 4.65 ms; the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame

The handover delay $T_{\text{Handover delay}}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 199.3 ms but the test allows 200 ms).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.2.10 E-UTRAN TDD - UTRAN TDD handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.2.10.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN TDD to UTRAN TDD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements when the target cell is unknown.

5.2.10.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

5.2.10.3 Minimum conformance requirements

The handover delay D_{handover} shall be less than maximum RRC procedure delay + $T_{\text{interrupt}}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

$D_{handover}$ equals the RRC procedure delay, which is 50 ms plus the interruption time stated in TS 36.133 [4] section 5.3.2.2.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

$$T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + 20 + 10*F_{max} \text{ ms}$$

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{offset} + T_{UL} + 30*F_{SFN} + 180 + 10*F_{max} \text{ ms}$$

Where:

T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} Equal to 1 if SFN decoding is required and equal to 0 otherwise

F_{max} denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

The normative reference for this requirement is TS 36.133 [4] clause 5.3.2 and A.5.2.10.

5.2.10.4 Test description

5.2.10.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.2.10.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.2.10.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.2.10.4.1-1: General test parameters for E-UTRA TDD to unknown UTRA (1.28 Mcps TDD OPTION) handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD cell
Final conditions	Active cell		Cell 2	UTRA 1.28Mcps TDD cell
CP length of cell 1			Normal	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211[8]
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211[8]
Time offset between cells			3 ms	Asynchronous cells 3µs or 92*Ts
Access Barring Information			Not Sent	No additional delays in random access procedure.
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		s	5	During T1, cell 2 shall be powered off, and during the off time the physical layer cell identity shall be changed.
T2		s	1	

5.2.10.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, a RRC message implying handover to UTRA 1.28Mcps TDD cell shall be sent to the UE including activation time "now". The end of the last TTI containing handover message is the beginning of T2 duration.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Tables 5.2.10.5-1 and 5.2.10.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

4. The start of T2 is the instant when the last TTI containing the RRC MobilityFromEUTRACommand message implying handover is sent to the UE, At that instant the SS shall switch the power settings from T1 to T2 as specified in Table 5.2.10.5-1. T2 starts.

5. If the UE transmits the UL to Cell 2 less than 280ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

6. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

7. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code – 50) mod 200 + 100) for next iteration of the test procedure loop.

8. Repeat step 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.2.10.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 5.2.10.4.3-1: Common Exception messages for E-UTRA TDD to unknown UTRA TDD cell handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.3-1 Table H.3.3-3

Table 5.2.10.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 5.2.10.4.3-3: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
lcoatonAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
utra-EcN0		Set according to specific test	
}			
}			

Table 5.2.10.4.3-4: *PhysCellIdentityUTRA-TDD*: Additional E-UTRAN TDD - UTRAN TDD handover

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysCellIdUTRA-TDD ::= SEQUENCE {	12	This is the typical value range used in UTRAN TDD tests.	

Table 5.2.10.4.3-5: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark
Downlink information common for all radio links - Downlink DPCH info common for all RL - Timing indicator - Default DPCH Offset Value	 Initialize 0 Integer (0..7)

5.2.10.5 Test requirement

Tables 5.2.10.4.1-1, 5.2.10.5-1 and 5.2.10.5-2 define the primary level settings including test tolerances for E-UTRAN TDD to unknown UTRAN TDD cell handover test.

Table 5.2.10.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case (cell1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
BWchannel	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2(OP.2 TDD)		OP.1 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RANote 1	dB		
OCNG_RBNote 1	dB		
$\hat{E}_s/I_{ot}$	dB	3+ TT	3+ TT
$\hat{E}_s/N_{oc}$	dB	3+TT	3+TT
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-95+ TT	-95+ TT
SCH_RP	dBm/15 kHz	-95+ TT	-95+ TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.2.10.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN TDD cell

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number[Note1]		Channel 2			
PCCPCH_Ec/Ior	dB	-3			
DwPCH_Ec/Ior	dB			0	
OCNS_Ec/Ior	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-infinity	13+TT	-infinity	13+TT
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-infinity	-70+TT	n.a.	
Propagation Condition		AWGN			
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note2: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The handover delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit PRACH to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

$D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt2} = T_{offset} + T_{UL} + 30 * F_{SFN} + 180 + 10 * F_{max}$ ms

$T_{offse\ t}$ = 10 ms; The frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel

T_{UL} = 10 ms; The time that can elapse until the appearance of the UL timeslot in the target cell

F_{SFN} = 1; Equal to 1 if SFN decoding is required and equal to 0 otherwise.

F_{max} = 0; The maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

Maximum RRC procedure delay = 50 ms as defined in TS 36.133

The handover delay $D_{handover}$ shall be less than a total of 280 ms in this test case.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3 Handover from E-UTRAN to non-3GPP RATs

5.3.1 E-UTRAN FDD - HRPD handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Mobility From EUTRA Command message parameters are undefined*
- *InterRAT-Target and InterRAT-Message field description is FFS*
- *The Message contents are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.3.1.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD.

5.3.1.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU}	It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).
SW_K	is $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message
SW_O	is $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message
KC	It is the number of known target HRPD cells in the message, and
OC	It is the number of unknown target HRPD cells in the message.

Note: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.1.

5.3.1.4 Test description

5.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.

2. The general test parameter settings are set up according to Table 5.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 5.3.1.4.3.

5. There is one E-UTRA FDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.1.4.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (HRPD) measurement quantity			CDMA2000 HRPD Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.1.5-1 and 5.3.1.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.1.5-1 and 5.3.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B2.

7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.1.5-1 and 5.3.1.5-2.

9. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

11. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

12. Repeat steps 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions.

Table 5.3.1.4.3-1: Common Exception messages for E-UTRAN FDD - HRPD handover

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7 Table H.3.1-8 Table H.3.3-3 Table H.3.3-4

Table 5.3.1.4.3-2: *SystemInformationBlockType8*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-7 SystemInformationBlockType8			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionParametersHRPD SEQUENCE {			
bandClassList SEQUENCE (SIZE (1..maxCDMA-BandClass)) OF SEQUENCE {	1 entry		
threshX-High	60(-30)	INTEGER (0..63)	
threshX-Low	63(-32)	INTEGER (0..63)	
}			

Table 5.3.1.4.3-3: *ReportConfigInterRAT-B2-CDMA2000*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7C ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-CDMA2000(EUTRA-Thres, CDMA2000-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	50(-90 dBm)	-90 dBm EUTRA-Thres is actual threshold value in dBm (50 - 140 dBm)	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2CDMA2000	[14 (-7 dB)]	Integer (0..63)	
}			
}			
}			
hysteresis	0		
timeToTrigger	ms0		
}			
}			
maxReportCells	8		
reportInterval	ms2048		
reportAmount	r1		
}			

Table 5.3.1.4.3-4: *MeasuredResults*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultsCDMA2000	MeasResultsCDMA2000		
}			
}			

Table 5.3.1.4.3-5: *MeasResultListCDMA2000*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsCDMA2000 ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellIdCDMA2000		
cgi-Info	CellGlobalIdCDMA2000		
measResult SEQUENCE {			
pilotPnPhase		Set according to specific test	
pilotStrength		Set according to specific test	
}			
}			

Table 5.3.1.4.3-6: *PhysCellIdentityCDMA2000-FDD*: Additional E-UTRAN FDD - HRPD handover

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysCellIdCDMA2000	50	See 36.508 Table 4.4.2-3	

5.3.1.5 Test requirement

Tables 5.3.1.4.1-1, 5.3.1.5-1 and 5.3.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD handover test.

Table 5.3.1.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	**T2**	**T3**
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			

N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)		
RSRP Note 3	dBm/15 KHz	-98 + TT	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT	0 +TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT	0 + TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.1.5-2: Cell Specific Test requirement Parameters for Cell 2 HRPD cell

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	T3
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21		
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT	0 + TT
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3 + TT	-3 + TT
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of HRPD chips (60) indicated by the search window for known target HRPD cells in the message

KC = 1; 1 known cell; HRPD cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target HRPD cells (0).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.2 E-UTRAN FDD - cdma2000 1xRTT handover

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Mobility From EUTRA Command message parameters are undefined*
- *InterRAT-Target and InterRAT-Message field description is FFS*
- *The Message contents are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.3.2.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT in RRC_CONNECTED state by meeting the UE RRC procedure delay and interruption time requirements.

5.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT.

5.3.2.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU}	It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).
SW_K	is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message
SW_O	is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message
KC	It is the number of known target cdma2000 1xRTT cells in the message, and
OC	It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.2.

5.3.2.4 Test description

5.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.3.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.2.4.3.
5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.2.4.1-1: General test parameters for E-UTRAN FDD to cdma2000 1xRTT handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Gap Pattern Id			0	As specified in TS 36.133 [4] Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity			RSRP	
Inter-RAT (cdma2000 1X) measurement quantity			CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDMA2000		dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		dB	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331 [5]
T1		s	5	
T2		s	≤10	
T3		s	1	

5.3.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. The RRC message implying handover shall be sent to the UE during T2, after the UE has reported Event B2. T3 is defined as the end of the last E-UTRAN TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table's 5.3.2.5-1 and 5.3.2.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. The neighbour cell shall broadcast its own PN offset and the measurement cell list of Cell 1 shall contain the PN offset of Cell 2. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 5.3.2.5-1 and 5.3.2.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B2.
7. SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.
8. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T2 to T3 as specified in Tables 5.3.2.5-1 and 5.3.2.5-2.
9. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T3 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.
10. After T3 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
11. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
12. Repeat steps 2-11 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.2.5 Test requirement

Tables 5.3.2.4.1-1, 5.3.2.5-1 and 5.3.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT handover test.

Table 5.3.2.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD cell

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2	T3
E-UTRA RF Channel number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)		
RSRP Note 3	dBm/15 KHz	-98 + TT	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT	0 +TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT	0 + TT
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 5.3.2.5-2: Cell Specific Test requirement Parameters for Cell 2 cdma2000 1xRTT cell

Parameter	Unit	Cell 2 (cdma2000 1X)		
		T1	T2	T3
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7		
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16		
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT	0 + TT
I_{oc}	dBm/1.2288 MHz	-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10 + TT	-10 + TT
Propagation Condition		AWGN		

The handover delay is defined as the time from the beginning of time period T3, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_K = 1$; $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips (60) indicated by the search window for known target cdma2000 1xRTT cells in the message

KC = 1; 1 known cell; cdma2000 1xRTT cell is identified during T2 and is therefore known before T3

OC = 0; OC is the number of unknown target cdma2000 1xRTT cells (0).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.3 E-UTRAN FDD - HRPD handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The MobilityFromEUTRACommand message parameters are undefined*
- *targetRAT-Type and targetRAT-MessageContainer field descriptions are FFS*
- *The Message contents are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.3.3.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to HRPD handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support HRPD.

5.3.3.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 50 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to HRPD, the UE shall be ready to start the transmission of the new reverse control channel in HRPD within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [17], the interruption time shall be less than $T_{interrupt}$

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU} It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell. T_{IU} can be up to one HRPD frame (26.66 ms).

SW_K is $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ where srch_win_k is the number of HRPD chips indicated by the search window for known target HRPD cells in the message

SW_O is $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of HRPD chips indicated by the search window for unknown target HRPD cells in the message

KC It is the number of known target HRPD cells in the message, and

OC It is the number of unknown target HRPD cells in the message.

NOTE: An additional delay in the interruption time may occur due to the reverse link silence interval [18], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.5.3.3.

5.3.3.4 Test description

5.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.3.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.3.4.3.
5. There is one E-UTRA FDD serving cell and one HRPD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.3.4.1-1: General test parameters for E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	≤5	
T2		s	1	

5.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting at T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table’s 5.3.3.5-1 and 5.3.3.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit the message containing Information Element systemTimeInfo as defined in TS 36.331 [5] clause 6.3.1. The neighbour cell shall broadcast its own PN offset. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

6. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table’s 5.3.3.5-1 and 5.3.3.5-2.

7. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 127 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

9. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.3.5 Test requirement

Tables 5.3.3.4.1-1, 5.3.3.5-1 and 5.3.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - HRPD handover: unknown target cell test.

Table 5.3.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter	Unit	Cell 1 (E-UTRAN FDD)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.3.3.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN FDD to HRPD handover: unknown target cell test case

Parameter	Unit	Cell 2 (HRPD)	
		T1	T2
$\frac{\text{Control } E_b}{N_t}$ (38.4 kbps)	dB	21	
$\frac{\text{Control } E_b}{N_t}$ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3 + TT
Propagation Condition		AWGN	

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the reverse control channel in HRPD to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 26.66 ms; T_{IU} can be up to one HRPD frame (26.66 ms).

$SW_O = 1$; $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of HRPD chips (60) indicated by the search window for unknown target HRPD cells in the message

KC = 0; KC is the number of known target HRPD cells (0).

OC = 1; OC is the number of unknown target HRPD cells (1).

Maximum RRC procedure delay = 50 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 127 ms in this test case (note: this gives a total of 50 ms for maximum RRC procedure delay plus 76.66 ms for Tinterrupt - allow 127 ms in the test).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

5.3.4 E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Mobility From EUTRA Command message parameters are undefined*
- *targetRAT-Type and targetRAT-MessageContainer field descriptions are FFS*
- *The Message contents are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

5.3.4.1 Test purpose

To verify the UE's ability to transfer a connection between the UE and E-UTRAN to cdma2000 1xRTT handover: unknown target cell in RRC_CONNECTED state by meeting the handover to an unknown target cell delay requirements.

5.3.4.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support cdma2000 1xRTT.

5.3.4.3 Minimum conformance requirements

The handover delay $D_{handover}$ shall be less than maximum RRC procedure delay (which is 130 ms) + $T_{interrupt}$ in RRC_CONNECTED state.

When the UE receives a RRC message implying handover to cdma2000 1xRTT, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1xRTT within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1xRTT cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 4.2.1 of [19], the interruption time shall be less than $T_{interrupt}$:

$$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O \text{ ms}$$

Where:

T_{IU}	It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1xRTT cell. T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).
SW_K	is $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ where srch_win_k is the number of cdma2000 1xRTT chips indicated by the search window for known target cdma2000 1xRTT cells in the message
SW_O	is $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips indicated by the search window for unknown target cdma2000 1xRTT cells in the message
KC	It is the number of known target cdma2000 1xRTT cells in the message, and
OC	It is the number of unknown target cdma2000 1xRTT cells in the message.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.2 and A.5.3.4.

5.3.4.4 Test description

5.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.14.
2. The general test parameter settings are set up according to Table 5.3.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 5.3.4.4.3.

5. There is one E-UTRA FDD serving cell and one cdma2000 1xRTT cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 5.3.4.4.1-1: General test parameters for E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth ($BW_{channel}$)		MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	≤5	
T2		s	1	

5.3.4.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. Starting at T2, Cell 2 becomes detectable and the UE receives a RRC handover command from the network.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table's 5.3.4.5-1 and 5.3.4.5-2. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. The SS shall transmit the message containing Information Element systemTimeInfo as defined in TS 36.331 [5] clause 6.3.1. The neighbour cell shall broadcast its own PN offset. The SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. The SS shall transmit a MobilityFromEUTRACommand message implying handover to Cell 2.

6. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE, at that instant the SS shall switch the power settings from T1 to T2 as specified in Table's 5.3.4.5-1 and 5.3.4.5-2.

7. If the UE starts to transmit the Reverse Control Channel to Cell 2 in less than 200 ms from the beginning of time period T2 then the number of successful tests is increased by one. Otherwise, the number of failure testes is increased by one.

8. After T2 expires, the UE shall be switched off. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

9. The SS shall set a different PN Offset on Cell 2 so that the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

10. Repeat steps 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

5.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions [FFS]

5.3.4.5 Test requirement

Tables 5.3.4.4.1-1, 5.3.4.5-1 and 5.3.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - cdma2000 1xRTT handover: unknown target cell test.

Table 5.3.4.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter	Unit	Cell 1 (E-UTRAN FDD)	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-98 + TT	-98 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 5.3.4.5-2: Cell Specific Test requirement Parameters for Cell 2 E-UTRAN FDD to cdma2000 1xRTT handover: unknown target cell test case

Parameter	Unit	Cell 2 (cdma2000 1X)	
		T1	T2
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7	
$\frac{\text{Sync } E_c}{I_{or}}$	dB	-16	
$\frac{\text{Paging } E_c}{I_{or}}$ (4.8 kbps)	dB	-12	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0 + TT
I_{oc}	dBm/1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10 + TT
Propagation Condition		AWGN	

The handover to an unknown target cell delay is defined as the time from the beginning of time period T2, to the moment the UE start to transmit the reverse control channel in cdma2000 1xRTT to Cell 2.

The handover delay $D_{handover}$ test requirement in this case is expressed as:

Handover delay $D_{handover}$ = maximum RRC procedure delay + $T_{interrupt}$

$T_{interrupt} = T_{IU} + [40] + [10]*KC*SW_K + [10]*OC*SW_O$ ms

T_{IU} = 20 ms; T_{IU} can be up to one cdma2000 1xRTT frame (20 ms).

$SW_O = 1$; $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ where srch_win_o is the number of cdma2000 1xRTT chips (60) indicated by the search window for unknown target cdma2000 1xRTT cells in the message

KC = 0; KC is the number of known target cdma2000 1xRTT cells (0).

OC = 1; OC is the number of unknown target cdma2000 1xRTT cells (1).

Maximum RRC procedure delay = 130 ms as defined in TS 36.133 [4].

The handover delay $D_{handover}$ shall be less than a total of 200 ms in this test case (note: this gives a total of 130 ms for maximum RRC procedure delay plus 70 ms for Tinterrupt).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

6 RRC Connection Mobility Control

When the UE is in RRC_CONNECTED, for which security has been activated, initiate the RRC re-establishment procedure in order to continue the RRC connection, the RRC re-establishment process takes place. In this process the UE initiates the procedure when one of the following conditions is met: upon re-entry of the service area after having detected radio link failure, upon handover failure or when lower layers detect problems as defined in TS 36.331 [5] clause 5.3.7.2. After selecting the best cell the UE send a 'RRC Connection Re-establishment Request message' to the System Simulator as defined in TS 36.331 [5] clause 5.3.7. The connection re-establishment succeeds only if the concerned cell is prepared i.e. has a valid UE context within the specified UE re-establishment delay period.

When the random access procedure is initiated by a PDCCH order or by the MAC sublayer itself, the random access process takes place. This process allows the PDCCH order or RRC optionally to indicate a random access preamble and PRACH resource as defined in TS 36.321 [11] clause 5.1. In this process from the physical layer perspective, the L1 random access procedure encompasses the transmission of random access preamble and random access response as defined in TS 36.213 [8] clause 6.1. The random access procedure is used when establishing the L1 communication between the UE and E-UTRAN.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3. This applies only for Re-establishment tests (subclause 6.1).

6.1 RRC Re-establishment

6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment

6.1.1.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.1.1.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}esta}\mathrm{blish\_delay} = \mathrm{TUL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

$$\mathrm{TUE\text{-}re\text{-}establish\_delay} = 50\ \mathrm{ms} + \mathrm{Nfreq}*\mathrm{Tsearch} + \mathrm{TSI} + \mathrm{TPRACH}$$

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.1.

6.1.1.4 Test description

6.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The parameter settings for the cells are set up according to Table 6.1.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.1.4.3.
5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.1.4.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A. 1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.1.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.1.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.1.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 1.5 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.1.4.3-1: Common Exception messages for E-UTRAN FDD Intra-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.1.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

6.1.1.5 Test requirement

Table 6.1.1.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment test case.

Table 6.1.1.5-1: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

$N_{freq} = 1$

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment

6.1.2.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.1.2.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

TUE-re-establish_delay = 50 ms + Nfreq*Tsearch + TSI + TPRACH

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.2.

6.1.2.4 Test description

6.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The parameter settings for the cells are set up according to Table 6.1.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 6.1.2.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.2.4.1-1: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA FDD inter-frequency carrier list size			1	2 E-UTRA FDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells 3ms or 92160*Ts
T1		s	5	
T2		ms	200	
T3		s	5	

6.1.2.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.2.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.2.5-1. T2 starts
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.2.5-1. T3 starts
7. If the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2 within 3 s from the beginning of time period T3, then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.2.4.3-1: Common Exception messages for E-UTRAN FDD Inter-frequency RRC Re-establishment

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.1.2.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE OF {	2 enrty		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

6.1.2.5 Test requirement

Table 6.1.2.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD Inter-frequency RRC Re-establishment test case.

Table 6.1.2.5-1: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD	OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA FDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

TUE_re-establish_delay = 50 ms + Nfreq* Tsearch + TSI + TPRACH

N_{freq} = 2

T_{search} = 800 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN FDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, within the allowance of 3 s in the test case.

6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

6.1.3.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.1.3.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

TUE-re-establish_delay = 50 ms + Nfreq*Tsearch + TSI + TPRACH

T_{search} is the time required by the UE to search the target cell.

T_{search} is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} is the additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq} is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.3.

6.1.3.4 Test description

6.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The parameter settings for the cells are set up according to Table 6.1.3.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.3.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.3.4.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number			1	Only one TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		ms	0	Minimum consecutive in-sync indications from lower layers
T310		-	1	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		ms	200	
T3		s	3	

6.1.3.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.Cell 1 is the active cell.

2. Set the parameters according to T1 in Table 6.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires,the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.3.5-1. T2 starts

6. When T2 expires,the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.3.5-1. T3 starts

7. If the UE starts to send PRACH preambles to cell 2 within 1.5 s from the beginning of time period T3. then the number of successful tests is increased by one.

8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.

9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.3.4.3-1: Common Exception messages for E-UTRAN intra frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-1
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.3.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN intra frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

6.1.3.5 Test requirement

Table 6.1.3.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.3.5-1: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
$\hat{E}_s/I_{ot}$	dB	1.54+TT	-Infinity	-Infinity	-3.79+TT	4+TT	4+TT
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	7+TT	-Infinity	-Infinity	4+TT	4+TT	4+TT
RSRP Note 3	dBm/15 KHz	-91+TT	-Infinity	-Infinity	-94+TT	-94+TT	-94+TT
Propagation Condition		AWGN					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE\_re\text{-}establish\_delay} = 50\text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

$N_{freq} = 1$

T_{search} = 100 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, within the allowance of 1.5 s in the test case.

6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

6.1.4.1 Test purpose

To verify that the UE is able to send a RRC Connection Re-establishment Request message to the System Simulator within the specified re-establishment delay limits from the moment it detects a loss in RRC connection.

6.1.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.1.4.3 Minimum conformance requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within $T_{re\text{-}establish\_delay}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-}establish\_delay}$) shall be less than:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}$$

T_{UL_grant}: It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit *RRCConnectionReestablishmentRequest* message.

The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [5] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE\_re\text{-}establish\_delay}$) requirement shall be less than:

TUE-re-establish_delay = 50 ms + Nfreq*Tsearch + TSI + TPRACH

T_{search}: It is the time required by the UE to search the target cell.

T_{search} = It is [100] ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

T_{search} = It is 800 ms if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [5] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

N_{freq}: It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; N_{freq} = 1 if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

The normative reference for this requirement is TS 36.133 [4] clause 6.1.2.1 and A.6.1.4.

6.1.4.4 Test description

6.1.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The parameter settings for the cells are set up according to Table 6.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 6.1.4.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 6.1.4.4.1-1: General test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A. 1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A. 2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Channel Number (cell 1)			1	
E-UTRA RF Channel Number (cell 2)			2	
E-UTRA TDD inter-frequency carrier list size			1	2 E-UTRA TDD carrier frequencies in total: 1 intra-frequency and 1 inter-frequency
Channel Bandwidth ($BW_{channel}$)		MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
Special subframe configuration			6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211
Time offset between cells		µs	3	Synchronous cells 3µs or 92*Ts
T1		s	5	
T2		ms	200	
T3		s	5	

6.1.4.4.2 Test procedure

The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.Cell 1 is the active cell.
2. Set the parameters according to T1 in Table 6.1.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.1.3.5-1. T2 starts.
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 6.1.3.5-1. T3 starts.
7. If the UE starts to send PRACH preambles to cell 2 within 3s from the beginning of time period T3. then the number of successful tests is increased by one.
8. After T3 expires, cause UE handover back to Cell 1 (if the handover fails, switch off the UE) or switch off the UE. Then ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2. Cell 1 is the active cell.
9. Repeat step 2-8 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

6.1.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.1.4.4.3-1: Common Exception messages for E-UTRAN inter frequency RRC Re-establishment requirement

Default Message Contents	
Common contents of system information blocks exceptions	Table H.2.5-2
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.1.4.4.3-2: MeasConfig-DEFAULT: Additional E-UTRAN inter frequency RRC Re-establishment requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE OF {	2 enrty		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	Not present		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedDependentParameters	Not present		
}			

6.1.4.5 Test requirement

Table 6.1.4.5-1 defines the primary level settings including test tolerances for E-UTRAN TDD Intra-frequency RRC Re-establishment test case.

Table 6.1.4.5-1: Cell specific test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			2		
$BW_{channel}$	MHz	10			10		
OCNG Patterns defined in A.2.1 (OP.1 TDD) and in A.2.2 (OP.2 TDD)		OP.1 TDD	OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD
PBCH_RA	dB	0			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						

$\hat{E}_s/I_{ot}$	dB	4+TT	-Infinity	-Infinity	-Infinity	-Infinity	7+TT
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4+TT	-Infinity	-Infinity	- Infinity	- Infinity	7+TT
RSRP Note 3	dBm/15 KHz	-94+TT	-Infinity	-Infinity	- Infinity	-Infinity	-91+TT
Propagation Condition		AWGN					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA TDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-}establish\_delay} = T_{UL\_grant} + T_{UE\_re\text{-}establish\_delay}.$$

Where:

T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$T_{UE\_re\text{-}establish\_delay}$ = 50 ms + N_{freq}* T_{search} + T_{SI} + T_{PRACH}

N_{freq} = 2

T_{search} = 800 ms

T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in TS 36.331 [5] for the target E-UTRAN TDD cell.

T_{PRACH} = 15 ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, within the allowance of 3 s in the test case.

6.2 Random Access

6.2.1 E-UTRAN FDD - Contention Based Random Access Test

6.2.1.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.2.1.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1 and A.6.2.1.

6.2.1.4 Test description

6.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B. 0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.1.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to Tables 6.2.1.5-1 and 6.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The UE shall establish a connection setup with SS, the random access procedure within the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response reception

4.1. In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

4.4. The UE shall consider this random access response reception successful and transmit the msg3.

4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.1.5-3 and 6.2.1.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.1.5-4 and 6.2.1.5-5.

5. Test 2: Correct behaviour when not receiving random access response reception

5.1. Repeat step 1-3.

5.2. In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preamble.

5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no random access response is received within the RA Response window of 10 sub-frames.

5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5. The UE shall consider this random access response reception successful and transmit the msg3.

5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.1.5-3 and 6.2.1.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.1.5-4 and 6.2.1.5-5.

6. Test 3: Correct behaviour when receiving a NACK on msg3

6.1. Repeat step 1-3.

6.2. In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

6.3. The UE shall consider this random access response reception successful and transmit the msg3.

6.4. The SS shall send NACK to all UE msg3 following a successful random access response.

6.5. The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1. Repeat step 1-3.

7.2. In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

7.3. The UE shall consider this random access response reception successful and transmit the msg3.

7.4. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

   8.1. In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   8.2. The UE shall consider this random access response reception successful and transmit the msg3.

   8.3. The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

   8.4. The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

   9.1. Repeat step 1-3.

   9.2. In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   9.3. The UE shall consider this random access response reception successful and transmit the msg3.

   9.4. The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

   9.5. The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires.

   9.6. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preamble has been received by the SS.

   9.7. The UE shall consider this random access response reception successful and transmit the msg3.

6.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.1.4.3-2: *SystemInformationBlockType1*: E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType1 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table 6.2.1.4.3-3: *SystemInformationBlockType3*: E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType3 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table 6.2.1.4.3-4: *RACH-ConfigCommon-DEFAULT*: E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
preamblesGroupAConfig SEQUENCE {}	Not present		
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			

Table 6.2.1.4.3-5: *PDSCH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-5 PDSCH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PDSCH-ConfigCommon-DEFAULT ::= SEQUENCE {			
referenceSignalPower	-5 (dBm)		1TX

6.2.1.5 Test requirement

Tables 6.2.1.5-1 and 6.2.1.5-2 define the primary level settings for E-UTRAN FDD - contention based random access test. Table 6.2.1.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 FDD	As defined in D.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		

$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.			

Table 6.2.1.5-2: RACH-Configuration parameters for E-UTRAN FDD - Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
mac-ContentionResolutionTimer	sf48	48 sub-frames
maxHARQ-Msg3Tx	4	
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be -30 dBm to withinthe accuracy specified in Table 6.2.1.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.1.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.1.5-5.

Test 2: Correct behaviour when not receiving random access response reception-

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.1.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.1.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.1.5-5.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the contention resolution timer expires.

Table 6.2.1.5-3: Absolute power tolerance for E-UTRAN FDD - Contention Based Random Access test

Tolerance	
Normal Conditions	**Extreme Conditions**
± 10.1 dB	± 13.1 dB

Table 6.2.1.5-4: Relative power tolerance for E-UTRAN FDD - Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	**Extreme Conditions**
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.1.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN FDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.2 E-UTRAN FDD - Non-Contention Based Random Access Test

6.2.2.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN FDD non-contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

6.2.2.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.2 and A.6.2.2.

6.2.2.4 Test description

6.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B. 0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.2.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE via a PDCCH order.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Tables 6.2.2.5-1 and 6.2.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.
4. Test 1: Correct behaviour when receiving Random Access Response

   4.1 In Test 1, the UE shall send the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

   4.3. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

   4.4. The UE shall consider this random access response reception successful.

   4.5. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.2.5-3 and 6.2.2.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.2.5-4 and 6.2.2.5-5.

5. Test 2: Correct behaviour when not receiving Random Access Response

   5.1. Repeat step 1-3.

   5.2. In Test 2, the UE shall send the signalled preamble to the SS. The SS shall not respond to the first 4 preamble.

5.3. The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power.

5.4. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5. The UE shall consider this random access response reception successful.

5.6. Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.2.5-3 and 6.2.2.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.2.5-4 and 6.2.2.5-5.

6.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.2.4.3-1: Common Exception messages for E-UTRAN FDD - Non-Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-1

Table 6.2.2.4.3-2: *SystemInformationBlockType1*: E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	Value/remark	Comment	Condition
SystemInformationBlockType1 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table 6.2.2.4.3-3: *RACH-ConfigCommon-DEFAULT*: E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
preamblesGroupAConfig SEQUENCE {}	Not present		
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			

Table 6.2.2.4.3-4: *PDSCH-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-5 PDSCH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PDSCH-ConfigCommon-DEFAULT ::= SEQUENCE {			
referenceSignalPower	-5 (dBm)		1TX

Table 6.2.2.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.2.4.3-6: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		

6.2.2.5 Test requirement

Tables 6.2.2.5-1 and 6.2.2.5-2 define the primary level settings for E-UTRAN FDD - non-contention based random access test. Table 6.2.2.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - Non-Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 FDD	As defined in D.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As defined in A.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As defined in A.1.2.
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.			

Table 6.2.2.5-2: RACH-Configuration parameters for E-UTRAN FDD - Non-Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
Ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified Table 6.2.2.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.2.5-4.

- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.2.5-5.

Test 2: Correct behaviour when not receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.2.5-3..
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.2.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.2.5-5.

Table 6.2.2.5-3: Absolute power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test

Tolerance	
Normal Conditions	Extreme Conditions
± 10.1 dB	± 13.1 dB

Table 6.2.2.5-4: Relative power tolerance for E-UTRAN FDD - Non-Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.2.5-5: Test requirements for Te Timing Error Limit for E-UTRAN FDD – Non-Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.3 E-UTRAN TDD - Contention Based Random Access Test

6.2.3.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD contention based random access requirements in an AWGN channel model and that the PRACH power settings and timing are within the specified limits.

6.2.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.2.3.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) and shall transmit the msg3 if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no Random Access Response is received within the RA Response window defined in clause 5.1.4 TS 36.321.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

The UE shall send ACK if the Contention Resolution is successful.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE Contention Resolution Identity MAC control element and the UE Contention Resolution Identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the Contention Resolution Timer expires.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.1 and A.6.2.3.

6.2.3.4 Test description

6.2.3.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B. 0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

6.2.3.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated on the centre sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

1. Ensure the UE is in State 2A according to TS 36.508 [7] clause 4.5.2A.
2. Set the parameters according to Tables 6.2.3.5-1 and 6.2.3.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The UE set up a connection with SS, and the random access procedure used in the connection setup is used in the test.
4. Test 1: Correct behaviour when receiving random access response reception

   4.1 In Test 1, the UE shall send the preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

   4.2 The UE shall consider the random access response reception not successful then re- select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

4.4The UE shall consider this random access response reception successful and transmit the msg3.

4.5 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.3.5-3 and 6.2.3.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.3.5-4 and 6.2.3.5-5.

5. Test 2: Correct behaviour when *not* receiving random access response reception

5.1 Repeat step 1-3.

5.2 In Test 2, the UE shall send the preamble to the SS. The SS shall not respond to the first 4 preamble.

5.3 The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if no random access response is received within the RA Response window of 10 sub-frames.

5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5 The UE shall consider this random access response reception successful and transmit the msg3.

5.6 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.3.5-3and 6.2.3.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.3.5-4 and 6.2.3.5-5.

6. Test 3: Correct behaviour when receiving a NACK on msg3

6.1 Repeat step 1-3.

6.2 In Test 3, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

6.3 The UE shall consider this random access response reception successful and transmit the msg3.

6.4 The SS shall send NACK all UE msg3 following a successful random access response.

6.5 The UE shall consider this contention resolution not successful then re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

7. Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

7.1 Repeat step 1-3.

7.2 In Test 4, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after first preambles have been received by the SS.

7.3 The UE shall consider this random access response reception successful and transmit the msg3.

7.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element not matching the CCCH SDU transmitted in msg3 uplink message.

7.5 The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires.

8. Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

8.1 Repeat step 1-3

8.2 In Test 5, the SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

8.3 The UE shall consider this random access response reception successful and transmit the msg3.

8.4 The SS shall send a message addressed to the Temporary C-RNTI with a UE contention resolution identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

8.5 The UE shall send ACK and consider the contention resolution successful and the random access procedure successfully completed.

9. Test 6: Correct behaviour when contention resolution timer expires

9.1 Repeat step 1-3.

9.2 In Test 6, the UE shall send the preamble to the SS. The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after the first preambles have been received by the SS.

9.3 The UE shall consider this random access response reception successful and transmit the msg3.

9.4 The SS shall send an ACK for msg3 but not send msg4 allowing the contention resolution timer to expire.

9.5 The UE shall consider the contention resolution not successful then re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires.

6.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.3.4.3-1: Common Exception messages for E-UTRAN TDD -Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.3.4.3-2: *SystemInformationBlockType1*: E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	Value/remark	Comment	Condition
SystemInformationBlockType1 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table 6.2.3.4.3-3: *SystemInformationBlockType3*: E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
SystemInformationBlockType3 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table 6.2.3.4.3-4: *RACH-ConfigCommon-DEFAULT*: E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12: RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
}			

Table 6.2.3.4.3-5: *PDSCH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD - Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-5: PDSCH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PDSCH-ConfigCommon-DEFAULT ::= SEQUENCE {			
referenceSignalPower	-5 (dBm)		1TX

6.2.3.5 Test requirement

Tables 6.2.3.5-1 and 6.2.3.5-2 define the primary level settings for E-UTRAN TDD - contention based random access test. Table 6.2.3.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 TDD	As defined in D.2.1.
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211[9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211[9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.			

Table 6.2.3.5-2: RACH-Configuration parameters for E-UTRAN TDD - Contention Based Random Access test

Field	Value	Comment
numberOfRA-Preambles	n52	
sizeOfRA-PreamblesGroupA	n52	No group B.
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
ra-ResponseWindowSize	sf10	10 sub-frames
mac-ContentionResolutionTimer	sf48	48 sub-frames
maxHARQ-Msg3Tx	4	
Note: For further information see Section 6.3.2 in 3GPP TS 36.331[5].		

Test 1: Correct behaviour when receiving random access response reception

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.3.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.3.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.3.5-5.

Test 2: Correct behaviour when not receiving random access response reception

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.3.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.3.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.3.5-5.

Test 3: Correct behaviour when receiving a NACK on msg3

- The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ retransmission is reached.

Test 4: Correct behaviour when receiving an incorrect message over Temporary C-RNTI

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires unless the received message includes a UE contention resolution identity MAC control element and the UE contention resolution identity included in the MAC control element matches the CCCH SDU transmitted in the uplink message.

Test 5: Correct behaviour when receiving a correct message over Temporary C-RNTI

- The UE shall send ACK if the contention resolution is successful.

Test 6: Correct behaviour when contention resolution timer expires

- The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the back off time expires if the contention resolution timer expires.

Table 6.2.3.5-3: Absolute power tolerance for E-UTRAN TDD - Contention Based Random Access test

Tolerance	
Normal Conditions	Extreme Conditions
± 10.1 dB	± 31.1 dB

Table 6.2.3.5-4: Relative power tolerance for E-UTRAN TDD - Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.3.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

6.2.4 E-UTRAN TDD - Non-Contention Based Random Access Test

6.2.4.1 Test purpose

To verify that the UE behaviour of the random access procedure is according to the E-UTRAN TDD non-contention based random access requirements in an AWGN model and that the PRACH power settings and timing are within the specified limits.

6.2.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

6.2.4.3 Minimum conformance requirements

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is as defined in TS 36.213 [8] clause 6 and the control of the RACH transmission is as defined in TS 36.321 [11] clause 5.1.

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula as defined in TS 36.213 [8] clause 6.1 and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as defined in table 6.3.5.1.1-1 of TS 36.101 [2] clause 6.3.5.1.1. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of TS 36.101 [2] clause 6.3.5.2.1.

The UE shall indicate a Random Access problem to upper layers if the maximum number of preambles transmission counter has been reached.

The UE may stop monitoring for Random Access Response(s) if the Random Access Response contains a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if all received Random Access Responses contain Random Access Preamble identifiers that do not match the transmitted Random Access Preamble.

The UE shall re-transmit the preamble with the calculated PRACH transmission power if no Random Access Response is received within the RA response window.

The normative reference for this requirement is TS 36.133 [4] clause 6.2.2.2 and A.6.2.4.

6.2.4.4 Test description

6.2.4.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B. 0.
3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

6.2.4.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centred on the centre sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE via a PDCCH order.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Tables 6.2.4.5-1 and 6.2.4.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.
4. Test 1: Correct behaviour when receiving Random Access Response

4.1. In Test 1, the UE shall send the signalled preamble to the SS. In response to the first 4 preambles, the SS shall transmit a random access response not corresponding to the transmitted random access preamble.

4.2 The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power if all received random access response contain random access preamble identifiers that do not match the transmitted random access preamble.

4.3 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

4.4 The UE shall consider this random access response reception successful.

4.5 Measure the power and timing of the first preamble and it shall not exceed the values specified in Tables 6.2.4.5-3 and 6.2.4.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.4.5-4 and 6.2.4.5-5.

5. Test 2: Correct behaviour when *not* receiving Random Access Response

5.1 Repeat step 1-3.

5.2 In Test 2, the UE shall send the signalled preamble to the SS. The SS shall not respond to the first 4 preamble.

5.3 The UE shall consider the random access response reception not successful then re-select a preamble and transmit with the calculated PRACH transmission power.

5.4 The SS shall transmit a random access response containing a random access preamble identifier corresponding to the transmitted random access after 5 preambles have been received by the SS.

5.5 The UE shall consider this random access response reception successful.

5.6 Measure the power and timing of the first preamble and it shall not exceed the values specified in clause Tables 6.2.4.5-3 and 6.2.4.5-5. Measure the relative power and timing applied to additional preambles (last 4 preambles) and it shall not exceed the values specified in Tables 6.2.4.5-4 and 6.2.4.5-5.

6.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 6.2.4.4.3-1: Common Exception messages for E-UTRAN TDD - Non-Contention Based Random Access test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.2-2

Table 6.2.4.4.3-2: *SystemInformationBlockType1*: E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1			
Information Element	Value/remark	Comment	Condition
SystemInformationBlockType1 ::= SEQUENCE {			
p-Max	23 (dBm)		

Table 6.2.4.4.3-3: *RACH-ConfigCommon-DEFAULT*: E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {			
preambleInfo SEQUENCE {			
numberOfRA-Preambles	n52		
preamblesGroupAConfig SEQUENCE {}	Not present		
}			
powerRampingParameters SEQUENCE {			
powerRampingStep	dB2		
preambleInitialReceivedTargetPower	dBm-120		
}			
)			

Table 6.2.4.4.3-4: *PDSCH-ConfigCommon-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-5: PDSCH-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PDSCH-ConfigCommon-DEFAULT ::= SEQUENCE {			
referenceSignalPower	-5 (dBm)		1TX

Table 6.2.2.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
cqi-ReportConfig	CQI-ReportConfig-DEFAULT		RBC
soundingRS-LU-ConfigDedicated	Not present		RBC

Table 6.2.2.4.3-6: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - Non-Contention Based Random Access test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		

6.2.4.5 Test requirement

Tables 6.2.4.5-1 and 6.2.4.5-2 define the primary level settings for E-UTRAN TDD - non-contention based random access test. Table 6.2.4.5-5 defines the uplink timing error limit including test tolerances.

Table 6.2.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN TDD - Non-Contention Based Random Access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern		OP.1 TDD	As defined in D.2.1.
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As defined in A.1.2.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As defined in A.2.2.
Special subframe configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211[9].
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211[9].
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331 [5].
Configured UE transmitted power (P_{CMAX})	dBm	23	As defined in clause 6.2.5 in 3GPP TS 36.101 [2].
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211 [9].
Back off Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321 [11].
Propagation Condition	-	AWGN	
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter. Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.			

Table 6.2.4.5-2: RACH-Configuration parameters for E-UTRAN TDD – Non-Contention Based Random Access test

Field	Value	Comment
powerRampingStep	dB2	
preambleInitialReceivedTargetPower	dBm-120	
preambleTransMax	n6	
Ra-ResponseWindowSize	sf10	10 sub-frames
Note: For further information see Section 6.3.2 in 3GPP TS 36.331 [5].		

Test 1: Correct behaviour when receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.4.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.4.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.4.5-5.

Test 2: Correct behaviour when *not* receiving Random Access Response

- The power of the first preamble shall be -30 dBm to within the accuracy specified in Table 6.2.4.5-3.
- The relative power for preamble ramping step shall be 2 dB to within the accuracy specified in Table 6.2.4.5-4.
- The transmit timing of all PRACH transmissions shall be within the accuracy specified in Table 6.2.4.5-5.

Table 6.2.4.5-3: Absolute power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test

Tolerance	
Normal Conditions	Extreme Conditions
± 10.1 dB	± 13.1 dB

Table 6.2.4.5-4: Relative power tolerance for E-UTRAN TDD - Non-Contention Based Random Access test

power step size (Up or down)	PRACH	
	Normal Conditions	Extreme Conditions
ΔP [dB]	[dB]	[dB]
2 ≤ ΔP < 3	± 3.7	± 5.7
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed for PRACH allocations		

Table 6.2.4.5-5: Test requirements for T_e Timing Error Limit for E-UTRAN TDD – Non-Contention Based Random Access test

Downlink Bandwidth (MHz)	T_e
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

7 Timing and Signalling Characteristics

The timing requirements are applicable for the uplink physical channels and signals specified in TS 36.211 [9] clause 5 (for uplink physical channels) as defined.

SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3.

7.1 UE Transmit Timing

7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy

7.1.1.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.1.1.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.1.3-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The uplink frame transmission takes place $(N_{\mathrm{TA}} + N_{\mathrm{TA\ offset}}) \times T_{\mathrm{s}}$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_{\mathrm{s}}$.

where:

N_{TA} is $0 \le N_{TA} \le 20512$

N_{TA_Ref} is 0 for PRACH; $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. $N_{\mathrm{TA\_Ref}}(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}})$ (in T_s units) for other channels is not changed until next timing advance is received.

$N_{TA\ offset}$ is 0 for frame structure type 1 as defined in TS 36.211 [9] clause 8.1.T_S denotes the basic time unit. The size of various fields in the time domain is expressed as a number of time units T_S = 1/(15000 x 2048) seconds.

Table 7.1.1.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_e
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in TS 36.133 [4] clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_{\mathrm{s}}$ before the downlink timing.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q.

2) The minimum aggregate adjustment rate shall be 7 * × T_S per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is defined in TS 36.133 [4] clause 7.1.2 and shown in table 7.1.1.3-2.

Table 7.1.1.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T_q
1.4	16*T_S
3	8*T_S
5	4*T_S
≥10	2*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.1.

NOTE 1: Due to the fact that the UE can update its timing at any interval, including just less than 200 ms, when evaluating the maximum adjustment rate in any 200 ms period an additional 2 * Ts uncertainty must be allowed for since there exists the possiblity of two timing adjustments during the evaluation period.

NOTE 2: The minimum adjustment rate of 7 * T_S per second is only to be evaluated from the end of the received downlink frame until the UE has converged on the new reference cell.

7.1.1.4 Test description

7.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. Propagation conditions are set according to Annex B clause B. 0.
3. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.1.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. After a connection is set up with Cell 1, the SS shall check that the UE transmit timing offset is within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.
6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 µs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of +128× T_S (approximately +4 µs) for 1.4MHz downlink bandwidth (Test 3) compared to that in step 5.
7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The SS shall check that the maximum time adjustment step size T_q is within Rule 1 as specified in clause 7.1.1.5, the minimum adjustment rate is within Rule 2 as specified in clause 7.1.1.5, and the maximum adjustment rate is within Rule 3 as specified in clause

7.1.1.5. The three rules apply until the UE transmit timing offset is within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8 .The SS shall check that the UE transmit timing offset stays within the limits specified in Table 7.1.1.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

9. Repeat step 1-8 for each sub-test in Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 as appropriate.

7.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.1.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.1.4.3-2: *SoundingRS-RL-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 and bw7 for Test 3	
srs-SubframeConfig		Set according to specific test; sc1 for Test 1 and Test 3 and sc3 for Test 2	FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.1.4.3-3: *SoudingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2 and 0 for Test 3	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.1.4.3-4: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			

Table 7.1.1.4.3-5: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.1.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		

7.1.1.5 Test requirement

Tables 7.1.1.5-1, 7.1.1.5-2 and 7.1.1.5-3 define the primary settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

Tables 7.1.1.5-4, 7.1.1.5-5 and the rules for adjustments made to the UE uplink timing include Test Tolerances.

Table 7.1.1.5-1: Cell Specific Test requirement Parameters for UE transmit timing accuracy for E-UTRAN FDD test case

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
DRX cycle	Ms	OFF	80[Note5]	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note1]		R.6 FDD	R.6 FDD	R.8 FDD
OCNG Pattern[Note2]		OP.2 FDD	OP.2 FDD	OP.4 FDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note4]	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN
Note 1: For the reference measurement channels, see section A.2.1. Note 2: For the OCNG pattern, see section D.1.2. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Io level has been derived from other parameters for information purpose. It is not asettable parameter. Note 5: DRX related parameters are defined in Table 7.1.1.5-3.				

Table 7.1.1.5-2: Sounding Reference Symbol Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test 1	Test 2	Test 3	Comment
	Value			
srs-BandwidthConfig	bw5	bw5	bw7	
srs-SubframeConfig	sc1	sc3	sc1	
ackNackSRS-SimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPts	N/A	N/A	N/A	Not applicable for FDD
srs-Bandwidth	0	0	0	No hopping
srs-HoppingBandwidth	hbw0	hbw0	hbw0	
freqDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
srs-ConfigIndex	0	77	0	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].				

Table 7.1.1.5-3: DRX Configuration to be used in UE transmit timing accuracy for E-UTRAN FDD test case

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The UE transmit timing offset shall be within the requirements in Table 7.1.1.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_{\mathrm{s}}$.

Table 7.1.1.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	T_e
1.4	$27*T_S$
≥3	$15*T_S$
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.1.5-5

2) The minimum aggregate adjustment rate shall be $6.5 \times T_S$ per second

3) The maximum aggregate adjustment rate shall be T_q per 200 ms, with T_q as defined in Table 7.1.1.5-5

Table 7.1.1.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	16.5*T_S
≥10	2.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.1.5-1.

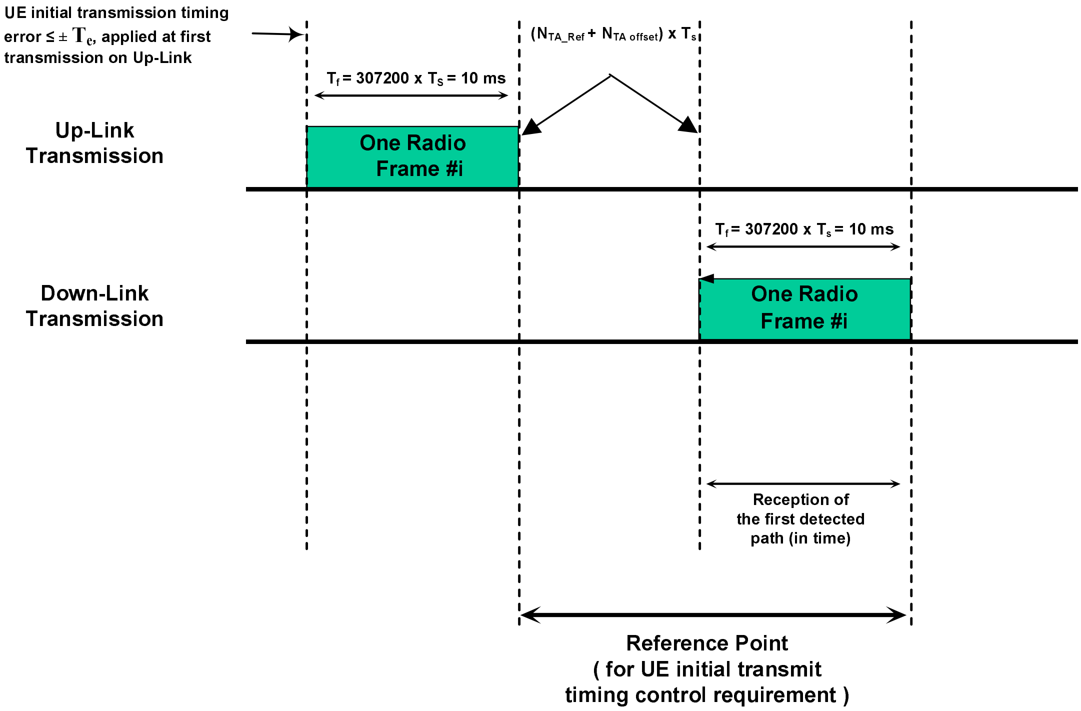

Figure 7.1.1.5-1: Illustration of measurement principle

7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy

7.1.2.1 Test purpose

To verify the UE have the capability to follow the frame timing change of the connected System Simulator. The method used is that the UE initial transmit timing accuracy, the maximum amount of timing change in one adjustment, and the minimum and maximum adjustment rate are within the specified limits based on the requirements.

7.1.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.1.2.3 Minimum conformance requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e as defined in table 7.1.2-1 of TS 36.133 [4] clause 7.1.2. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The uplink frame transmission takes place $(N_{\mathrm{TA}} + N_{\mathrm{TA\ offset}}) \times T_{\mathrm{s}}$ before the reception of the first detected path (in time) of the corresponding downlink frame from the reference cell. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_{\mathrm{s}}$.

where:

N_{TA} is $0 \le N_{TA} \le 20512$

N_{TA_Ref} is 0 for PRACH; N$(N_{\mathrm{TA_Ref}} + N_{\mathrm{TA\ offset}})$ (in T_s units) for other channels is the difference between UE transmission timing and the downlink timing immediately after when the last timing advance in TS 36.133 [4] clause 7.3 was applied. N_{TA_Ref} in T_s units) for other channels is not changed until next timing advance is received.

$N_{TA\ offset}$ is 624 for frame structure type 2 as defined in TS 36.211 [9] clause 8.1. T_S denotes the basic time unit. The size of various fields in the time domain is expressed as a number of time units T_S = 1/(15000 x 2048) seconds.

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in TS 36.133 [4] clause 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds $\pm T_e$ the UE is required to adjust its timing to within $\pm T_e$. The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_s$ before the downlink timing.

All adjustments made to the UE uplink timing $(N_{\mathrm{TA}} + N_{\mathrm{TA\ offset}}) \times T_s$ shall follow these rules:

1) The maximum amount of the magnitude of the timing change in one adjustment shall be T_q

2) The minimum aggregate adjustment rate shall be $7 \times T_S$ per second.

3) The maximum aggregate adjustment rate shall be T_q per 200 ms.

Where the maximum timing error value T_e is specified in table 7.1.2.3-1 and maximum autonomous time adjustment step T_q is specified in table 7.1.2.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.2.

Table 7.1.2.3-1: T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	24*T_S
≥3	12*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

Table 7.1.2.3-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	16*T_S
3	8*T_S
5	4*T_S
≥10	2*T_S
Note: T_S is the basic timing unit defined in TS 36.211	

NOTE 1: Due to the fact that the UE can update its timing at any interval, including just less than 200 ms, when evaluating the maximum adjustment rate in any 200 ms period an additional 2* T_q uncertainty must be allowed for since there exists the possiblity of two timing adjustment during the evaluation period.

NOTE 2: The minimum adjustment rate of $7 \times T_S$ per second is only to be evaluated from the end of the received downlink frame until the UE has converged on the new reference cell.

7.1.2.4 Test description

7.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz and 1.4 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

2. Propagation conditions are set according to Annex B clause B.0.

3. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

7.1.2.4.2 Test procedure

The test consists of a single cell. The transmit timing accuracy is verified related to the downlink frame timing of Cell 1. The downlink timing of Cell 1 is changed and the changes in UE transmit timing are observed. The transmit timing is verified by the UE transmitting SRS (Sounding Reference Symbols) used as a measurement reference facilitating the SS timing estimation.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to Test 1, Test 2, or Test 3 in Tables 7.1.2.5-1 and 7.1.2.5-2 and 7.1.2.5-3 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. After a connection is set up with Cell 1, the SS shall check that the UE transmit timing offset is 624× T_S to within the T_e limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

6. The SS adjusts the downlink timing for Cell 1 to a delay of +64 × T_S (approximately +2 µs) for ≥3 MHz downlink bandwidth (Test 1, Test 2) and a delay of +128× T_S (approximately +4 µs) for 1.4MHz downlink (Test 3) bandwidth compared to that in step 5.

7. Step 7 applies for Test 1 and Test 3, but is omitted for Test 2. The SS shall check that the maximum time adjustment step size T_q is within Rule 1 as specified in clause 7.1.2.5, the minimum adjustment rate is within Rule 2 as specified in clause 7.1.2.5, and the maximum adjustment rate is within Rule 3 as specified in clause 7.1.2.5. The three rules apply until the UE transmit timing offset is (624 × T_S) to within the limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

8. The SS shall check that the UE transmit timing offset stays at 624× T_S to within the T_e limits specified in Table 7.1.2.5-4 with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

9. Repeat step 1-8 for each sub-test in Tables 7.1.2.5-1, 7.1.2.5-2 and 7.1.2.5-3 as appropriate.

7.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.1.2.4.3-1: Common Exception messages for UE transmit timing accuracy for E-UTRAN FDD test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.1.2.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig		Set according to specific test; bw5 for Test 1 and Test 2 , bw7 for Test 3	
srs-SubframeConfig	src3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	FALSE		
}			

Table 7.1.2.4.3-*3*: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	indefinite duration	
srs-ConfigIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.2.4.4-3: MAC-MainConfig-RBC: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			

Table 7.1.2.4.3-5: *CQI-ReportConfig-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-2 CQI-ReportConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportModeAperiodic	rm30		
nomPDSCH-RS-EPRE-Offset	0		
cqi-ReportPeriodic CHOICE {			
release	NULL		
}			

Table 7.1.2.4.3-6: *MAC-MainConfig-RBC*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
timeAlignmentTimerDedicated	Infinity		

7.1.2.5 Test requirement

Tables 7.1.2.5-1, 7.1.2.5-2 and 7.1.2.5-3 define the primary settings including test tolerances for UE transmit timing for E-UTRAN TDD test.

Table 7.1.2.5-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit	Value		
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10	1.4
DRX cycle	Ms	OFF	80[Note7]	OFF
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	R.6 TDD	R.8 TDD
OCNG Pattern[Note4]		OP.2 TDD	OP.2 TDD	OP.4 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA[Note3]				
OCNG_RB[Note3]				
N_{oc}	dBm/15 kHz	-98	-98	-98
$\hat{E}_s/I_{ot}$	dB	3.30	3.30	3.30
$\hat{E}_s/N_{oc}$	dB	3.30	3.30	3.30
Io[Note6]	dBm/9 MHz	-65.25	-65.25	N/A
	dBm/1.08 MHz	N/A	N/A	-74.46
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211
Note 3: For the reference measurement channels, see section A.2.2.
Note 4 For the OCNG pattern, see section D.2.2(for 10MHz) and D.2.4(for 1.4MHz).
Note 5: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 6: Io level has been derived from other parameters for information purpose. It is not a settable parameter.
Note 7: DRX related parameters are defined in Table 7.1.2.5-3.

Table 7.1.2.5-2: Sounding Reference Signal Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Tset3	Comment
	Value			
srsBandwidthConfiguration	bw5	bw5	bw7	
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	FALSE	
srsBandwidth	0	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	hbw0	
frequencyDomainPosition	0	0	0	
duration	TRUE	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	85	15	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	0	
cyclicShift	cs0	cs0	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331.				

Table 7.1.2.5-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Test2	Comment
	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331.		

The UE transmit timing offset shall be within the requirements in Table 7.1.2.5-4.

The reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$ seconds.

Table 7.1.2.5-4: Test requirement for T_e Timing Error Limit

Downlink Bandwidth (MHz)	$T_{e\_}$
1.4	27*T_S
≥3	15*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

The UE shall be capable of changing the transmission timing according to the received downlink frame. When the transmission timing error between the UE and the reference cell exceeds $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum adjustment step size T_q shall be within the requirements in Table 7.1.2.5-5

2) The minimum aggregate adjustment rate shall be $6.5 \times T_S$ per second

3) The maximum aggregate adjustment rate shall be T_q per 200 ms, with T_q as defined in Table 7.1.2.5-5

Table 7.1.2.5-5: Test requirement for T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	$T_{q\_}$
1.4	16.5*T_S
≥10	2.5*T_S
Note: T_S is the basic timing unit defined in TS 36.211 [9]	

An illustration of the measurement principle is shown in Figure 7.1.2.5-4.

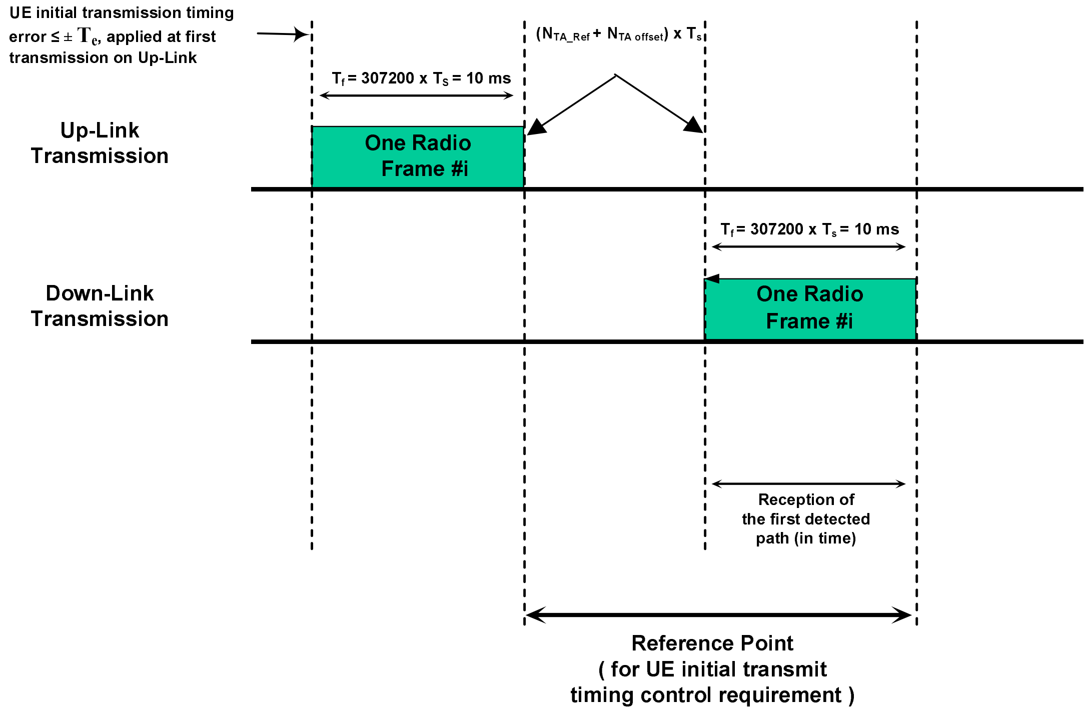

Figure 7.1.2.5-4: Illustration of measurement principle

7.2 UE Timing Advance

7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy

7.2.1.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its transmissions with accuracy by meeting the E-UTRAN FDD timing advance adjustment requirements in an AWGN model.

7.2.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.2.1.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to ±4 $\times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of 16 $\times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.1.

7.2.1.4 Test description

7.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.
2. The general test parameter settings are set according to Table 7.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B. 0.
4. There is one E-UTRA FDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.1.4.1-1: General Test Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.1.4.2 Test procedure

The test consists of a single cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and SRS are sent from the UE and received by the SS. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Tables 7.2.1.5-1 and 7.2.1.5-2. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.
6. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.1.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.
9. The UE shall transmit SRS and adjust its uplink timing at the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE received the time advance command.
10. The result from the SRS and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
12. Repeat step 1-11 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.1.4.3-1: Common Exception messages for E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.1.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	sc3		FDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			
}			

Table 7.2.1.4.3-3: *SoundingRSUL-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srs-HoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD - UE timing advance adjustment accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	Infinity		

7.2.1.5 Test requirement

Tables 7.2.1.4.1-1, 7.2.1.5-1 and 7.2.1.5-2 define the primary level settings for E-UTRAN FDD - UE timing advance adjustment accuracy test.

Table 7.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD - UE timing advance adjustment accuracy test case

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note1	dB		
OCNG_RB Note1	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io Note2	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.1.5-2: Sounding Reference Symbol Configuration to be used in E-UTRAN FDD - UE timing advance adjustment accuracy test case

Field	Value	Comment
srs-BandwidthConfig	bw5	
srs-SubframeConfig	sc3	Once every 5 subframes
ackNackSRS-SimultaneousTransmission	FALSE	
srsMaxUpPts	N/A	Not applicable for E-UTRAN FDD
srs-Bandwidth	0	No hopping
srs-HoppingBandwidth	hbw0	
freqDomainPosition	0	
duration	TRUE	Indefinite duration
srs-ConfigIndex	7	SRS periodicity of 10.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [15].		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub-frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy

7.2.2.1 Test purpose

The purpose of the test is to verify E-UTRAN TDD Timing Advance adjustment accuracy requirements, in an AWGN model.

7.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.2.2.3 Minimum conformance requirements

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance according to TS 36.321 [11] clause 5.2.

The UE shall adjust the timing of its uplink transmission timing at sub-frame *n*+6 for a timing advancement command received in sub-frame *n*.

The UE shall adjust the timing of its transmission with a relative accuracy better than or equal to $\pm 4 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiple of $16 \times T_S$ and is relative to the current uplink timing.

In case of random access response, 11-bit timing advance command, T_A, indicates N_{TA} values by index values of T_A = 0, 1, 2, ..., 1282, where an amount of the time alignment is given by $N_{TA} = T_A \times 16$ according to TS 36.213 [8] clause 4.2.3. N_{TA} is defined in TS 36.211 [9].

In other cases, 6-bit timing advance command, T_A, indicates adjustment of the current N_{TA} value, $N_{TA,old}$, to the new N_{TA} value, $N_{TA,new}$, by index values of T_A = 0, 1, 2,..., 63, where $N_{TA,new} = N_{TA,old} + (T_A - 31) \times 16$ according to TS 36.213 [8] clause 4.2.3. Adjustment of N_{TA} value by a positive or a negative amount indicates advancing or delaying the uplink transmission timing by a given amount respectively.

For UE timers, the UE shall comply with the timer accuracies according to TS 36.133 [4] table 7.2.2-1. The requirements are only related to the actual timing measurements internally in the UE.

The normative reference for this requirement is TS 36.133 [4] clause 7.3 and A.7.2.2.

7.2.2.4 Test description

7.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noises source to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.18.

2. The general test parameter settings are set according to Table 7.2.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. There is one E-UTRA TDD carrier and one cell specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.2.2.4-1 General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Timing Advance Command (T_A) value during T1		31	N_{TA} = 0 for the purpose of establishing a reference value from which the timing advance adjustment accuracy can be measured during T2
Timing Advance Command (T_A) value during T2		39	N_{TA} = 128
DRX		OFF	
T1	s	5	
T2	s	5	

7.2.2.4.2 Test procedure

The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and Sounding Reference Signals (SRS), are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured. The UE Time Alignment Timer (timeAlignmentTimer IE), defined in TS 36.321 [11] clause 5.2, shall be configured so that it does not expire in the duration of the test.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Tables 7.2.2.5-1, 7.2.2.5-2 and 7.2.2.5-3. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. SS shall transmit one message with a timing advance command, T_A. The timing advance command, T_A, shall be set to 31 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T1 shall be $N_{TA} = 0$.
6. The UE shall transmit SRS and adjust its uplink timing from the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE receive the time advance command.
7. When T1 expires, the SS shall switch the timing advance command (T_A) from T1 to T2 as specified in Table 7.2.1.5-1.
8. SS shall transmit a sequence of messages with timing advance command, T_A. The timing advance command, T_A, shall be set to 39 which indicate adjustment of the current N_{TA} value. The timing advance adjustment during T2 shall be $N_{TA} = 128$.
9. The UE shall transmit SRS and adjust its uplink timing from the beginning of sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the sub-frame where the UE receive the time advance command.
10. The timing of the first SRS transmission after sub-frame n+6 and adjustment of the timing advance in step 9) is used to measure that the UE adjusts the timing of its transmission with a relative accuracy better than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission.
11. If the UE adjust the timing of its transmission within a relative accuracy greater than or equal to $\pm 4.5 \times T_S$ to the signalled timing advance value compared to the timing of preceding uplink transmission then the number of successful tests is increased by one. Otherwise, the number of failure tests is increased by one.
12. Repeat step 1-11 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.2.2.4.3-1: Common Exception messages for E-UTRAN TDD - UE timing advance adjustment accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.4-2

Table 7.2.2.4.3-2: *SoundingRS-UL-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigCommon-DEFAULT ::= SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw5	Channel-bandwidth-dependent parameter	
srs-SubframeConfig	src3		TDD
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	FALSE		
}			

Table 7.2.2.4.3-3: *SoundingRS-UL-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.508 clause 4.6.3			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRSUL-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0		
freqDomainPosition	0		
duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN TDD - UE timing advance adjustment accuracy test requirement

Derivation Path: 36.508 clause 4.8.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
dl-SCH-Config SEQUENCE {}	Not present		
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
timeAlignmentTimerDedicated	infinity		

7.2.2.5 Test requirement

Tables 7.2.2.4.1-1, 7.2.2.5-1 and 7.2.2.5-2 define the primary level settings for E-UTRAN TDD - UE timing advance adjustment accuracy test.

Table 7.2.2.5-1 Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration[Note1]		6	
Uplink-downlink configuration[Note2]		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note3]	dB		
OCNG_RB[Note3]	dB		
Timing Advance Command (T_A)		31	39
$\hat{E}_s/I_{ot}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
Io[Note4]	dBm/9 MHz	-65.5	
Propagation Condition		AWGN	
Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211. Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211. Note 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: Io level has been derived from other parameters for information purpose. It is not a settable parameter.			

Table 7.2.2.5-2:Sounding Reference Symbol Configuration for E-UTRAN TDD Transmit Timing Accuracy Test

Field	Value	Comment
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	
srsBandwidth	bw0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	15	SRS periodicity of 10ms.
transmissionComb	0	
cyclicShift	cs0	No cyclic shift
Note: For further information see section 6.3.2 in 3GPP TS 36.331.		

The UE shall apply the signalled Timing Advance value to the transmission timing at the designated activation time i.e. 6 sub frames after the reception of the timing advance command.

The UE shall adjust the timing of its transmissions with an relative accuracy better than or equal to $\pm 4.5 \times T_S$ seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. This requirement includes test tolerances.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

7.3 Radio Link Monitoring

Editor's note: The test cases of subclause 7.3 are incomplete. The following aspects are either missing or not yet determined:

- *Minimum requirements in TS 36.133 [4] are not yet completed and still under investigation in RAN4*

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

7.3.1.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.1.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send an out-of-sync indication to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.1.

7.3.1.4 Test description

The test consists of four subtests with one cell configured; the difference between the subtests is the number of transmitter antennas and the propagation channel. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.1.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

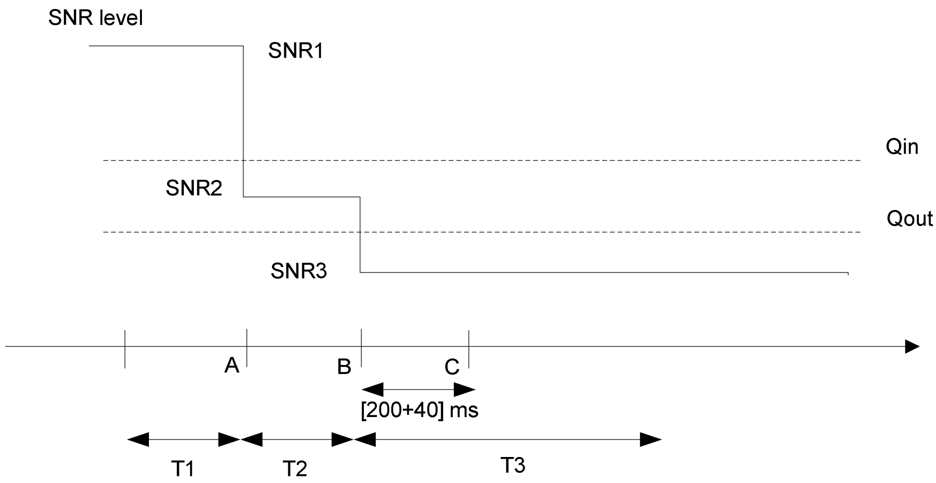

Figure 7.3.1.4-1: SNR variation for out-of-sync testing

7.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1:As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.10 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.9
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.10

2. The general test parameter settings for the different subtests are set up according to Table 7.3.1.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.1.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.1.4.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	R.6 FDD	R.7 FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	8	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	2	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		s	1	1	1	1	
T2		s	0.4	0.4	0.4	0.4	
T3		s	0.5	0.5	0.5	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.							

7.3.1.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 7.3.1.5-1 for subtest 1 and 2 and according to T1 in Table and 7.3.1.5-2 for subtest 3 and 4. Propagation conditions are set according to Annex B clause B.1.1 for subtests 1 and 2 and according to B.2.2 for subtests 3 and 4. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and according to T2 in Table 7.3.1.5-2 for subtests 3 and 4. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and according to T3 in Table 7.3.1.5-2 for subtests 3 and 4. T3 starts.
5. If the SS stops receiving CQI reports within 240 ms from the start of T3 the number of successful tests is increased by one, otherwise the number of failed tests is increased by one.
6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.1.5-1 for subtests 1 and 2 and Table 7.3.1.5-2 for subtests 3 and 4.
7. If the UE has not reestablished the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.1.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-1

Table 7.3.1.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.1.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync test 2 and 4 requirements

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.1.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.1.5 Test requirement

Table 7.3.1.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6	dB	-4.1	-8.9	-14.1	-4.3	-8.9	-14.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.

Table 7.3.1.5-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
SNR Note 6	dB	-0.6	-4.7	-12.3	-1.4	-5.3	-13.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.1.4-1.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During time duration T1 and T2 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 2 ms.

The UE shall stop reporting the CQI within 240 ms from the start of the time duration T3.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync

7.3.2.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.2.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331[5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.2.

7.3.2.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the number of transmitter antennas. Each subtest consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.2.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

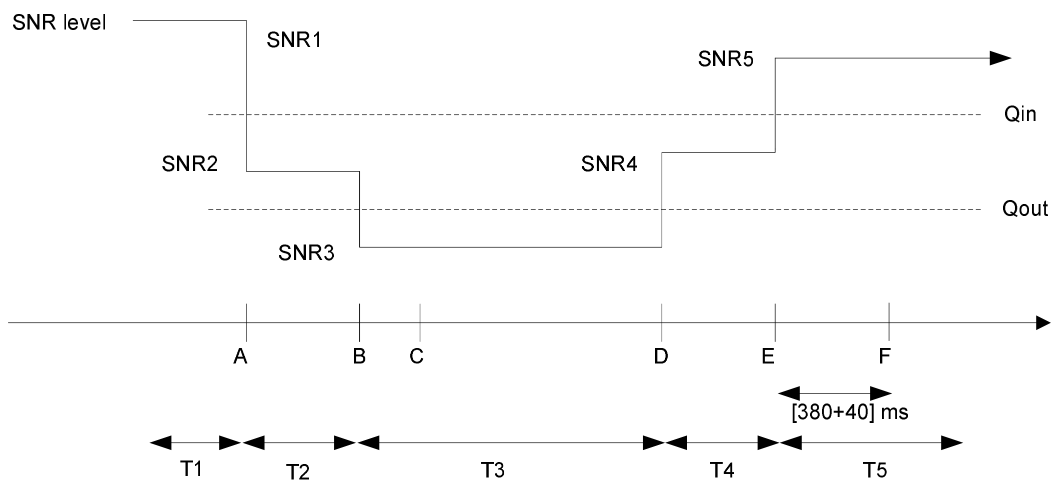

Figure 7.3.2.4-1: SNR variation for in-sync testing

7.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.9.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.

2. The general test parameter settings for the different subtest are set up according to Table 7.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.2.4.3.

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.2.4.1-1: General test parameters for E-UTRAN FDD in-sync testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	
DRX			OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	ETU 70 Hz	
T1		s	0.5	0.5	
T2		s	0.4	0.4	
T3		s	1.36	1.36	
T4		s	0.4	0.4	
T5		s	1	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 7.3.2.5-1 for subtests 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.2.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.2.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.2.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.2.5-1. T5 starts.
7. If the SS stops receiving CQI reports before point F (420 ms after the start of time duration T5) in Figure 7.3.2.4-1 the number of failed tests is increased by one, otherwise the number of successful tests is increased by one.
8. Repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.2.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for in-sync

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-2

Table 7.3.2.4.3-2 : *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation

CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.2.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for in-sync test 2 requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.2.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.2.5 Test requirement

Table 7.3.2.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x2 Low					2x2 Low				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD					OP.2 FDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA Note 1	dB										
OCNG_RB Note 1	dB										
SNR Note 6	dB	-0.6	-4.7	-12.3	-7.2	-0.6	-1.4	-5.3	-13.1	-8.2	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.2.4-1

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During time duration T1, T2, T3, T4 and T5 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 2 ms.

If the UE stops reporting the CQI before Point F (420 ms after the start of the time duration T5), the UE fails the tests.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

7.3.3.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.3.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send an out-of-sync indication to the higher layers within 200 ms Q_{out} evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.3.

7.3.3.4 Test description

The test consists of four subtests with one cell configured; the difference between the subtests is the number of transmitter antennas and the propagation channel. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.3.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

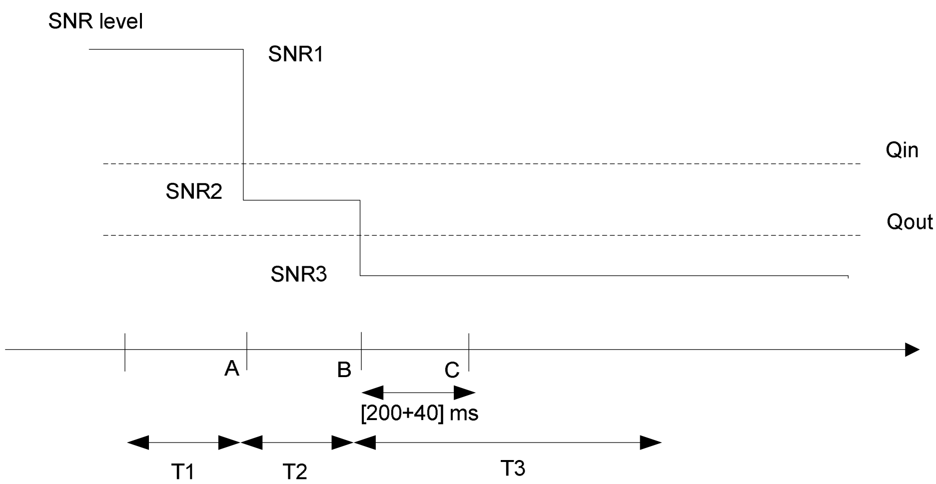

Figure 7.3.3.4-1: SNR variation for out-of-sync testing

7.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders).
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.10 (without using the faders).
   For subtest 3: As Shown in TS 36.508 [7] Annex A figure A.9
   For subtest 4: As Shown in TS 36.508 [7] Annex A figure A.10

2. The general test parameter settings for the different subtests are set up according to Table 7.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.3.4.3.
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.3.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in section A.2.1 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
E-UTRA RF Channel Number			1	1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	8	8	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	1	1	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		s	1	1	1	1	
T2		s	0.4	0.4	0.4	0.4	
T3		s	0.5	0.5	0.5	0.5	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel							

7.3.3.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 7.3.3.5-1 for subtests 1 and 2 and according to T1 in Table and 7.3.3.5-2 for subtest 3 and 4. Propagation conditions are set according to Annex B clause B.1.1 for subtests 1 and 2 and according to B.2.2 for subtests 3 and 4. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and according to T2 in Table 7.3.3.5-2 for subtests 3 and 4. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and according to T3 in Table 7.3.3.5-2 for subtests 3 and 4. T3 starts.

5. If the SS stops receiving CQI reports within 2 40 ms from the start of T3 the number of successful tests is increased by one, otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.3.5-1 for subtests 1 and 2 and Table 7.3.3.5-2 for subtests 3 and and 4.

7. If the UE has not reestablished the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

6. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.3.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-1

Table 7.3.3.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.3.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync test 2 and 4 requirements

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.3.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.3.5 Test requirement

Table 7.3.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 3]	dB						
OCNG_RB[Note 3]	dB						
SNR[Note 8]	dB	-4.5	-8.5	-13.7	-4.6	-8.6	-13.8
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		AWGN			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.

Table 7.3.3.5-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

Parameter	Unit	Test 3			Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		1x2 Low			2x2 Low		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		0			-3		
PCFICH_RB	dB	4			1		
PDCCH_RA	dB	0			-3		
PDCCH_RB	dB	0			-3		
PBCH_RA	dB	0			-3		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note 3]	dB						
OCNG_RB[Note 3]	dB						
SNR[Note 8]	dB	-0.6	-4.5	-12.1	-1.4	-5.0	-12-8
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			ETU 70 Hz		
Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211. Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211. Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1. Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1. Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.3.4-1.							

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During time duration T1 and T2 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 1 ms.

The UE shall stop reporting the CQI within 240 ms from the start of the time duration T3.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync

7.3.4.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.4.3 Minimum conformance requirements

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms Q_{in} evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power shall be turned off within 40 ms after expiry of T310 timer as specified in TS 36.331 [5] section 5.3.11.

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.4.

7.3.4.4 Test description

The test consists of 2 subtests with one cell configured; the difference between the subtests is the number of transmitter antennas. Each subtest consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.4.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

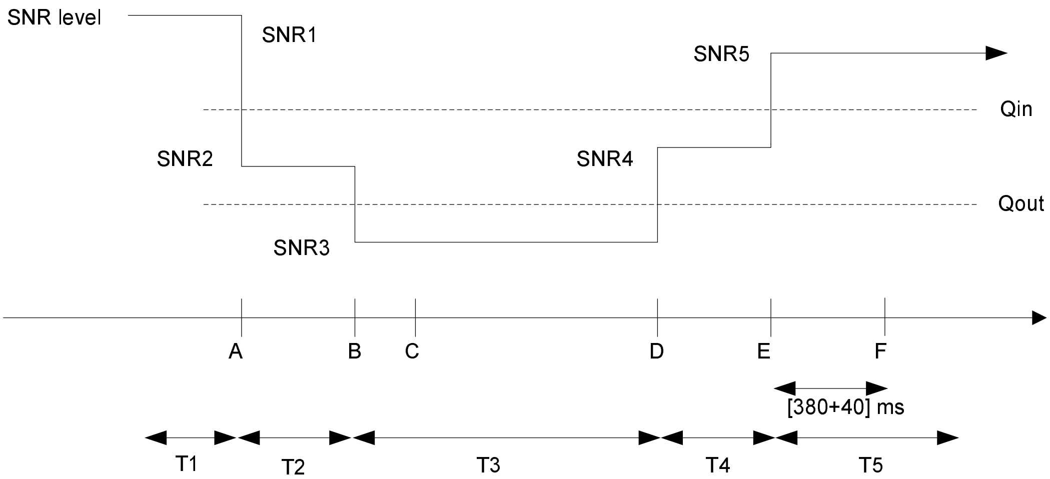

Figure 7.3.4.4-1: SNR variation for in-sync testing

7.3.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. For subtest 1 (one transmitter antenna): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.9.
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and faders, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.10.

2. The general test parameter settings for the different subtest are set up according to Table 7.3.4.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.4.4.3.

6. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.4.4.1-1: General test parameters for E-UTRAN TDD in-sync testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	As specified in section A.2.2 None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
n sync transmission parameters (Note 1)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	
	Ratio of PCFICH to RS EPRE		4	1	
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		0	-3	
	Ratio of PDCCH to RS EPRE	dB	4	1	
	Ratio of PCFICH to RS EPRE	dB	4	1	
DRX			OFF	OFF	
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	2000	T310 is enabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	ETU 70 Hz	
T1		s	0.5	0.5	
T2		s	0.4	0.4	
T3		s	1.46	1.46	
T4		s	0.4	0.4	
T5		s	1	1	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.4.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 7.3.4.5-1 for subtest 1 and 2 respectively. Propagation conditions are set according to Annex B.2.2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.4.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.4.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.4.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.4.5-1. T5 starts.
7. If the SS stops receiving CQI reports before point F (420 ms after the start of time duration T5) in Figure 7.3.4.4-1 the number of failed tests is increased by one, otherwise the number of successful tests is increased by one .
8. Repeat steps 2-7 for both subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.4.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for in-sync

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-2

Table 7.3.4.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	**Explanation**
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.4.4.3-3: *PhysicalConfigDedicated-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for in-sync test 2 requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
antennaInfo CHOICE {			
defaultValue	NULL		2TX
}			
}			

Table 7.3.4.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring Test for in-sync

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.5-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
timeAlignmentTimerDedicated	Infinity		

7.3.4.5 Test requirement

Table 7.3.4.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring tests # 1 and # 2

Parameter	Unit	Test 1					Test 2				
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1					1				
$BW_{channel}$	MHz	10					10				
Correlation Matrix and Antenna Configuration		1x2 Low					2x2 Low				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD					OP.2 TDD				
ρ_A, ρ_B		0					-3				
PCFICH_RB	dB	4					1				
PDCCH_RA	dB	0					-3				
PDCCH_RB	dB	0					-3				
PBCH_RA	dB	0					-3				
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB										
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR [Note 8]	dB	-0.6	-4.5	-12.1	-7.2	-0.6	-1.4	-5.0	-12.8	-8.2	-1.4
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		ETU 70 Hz					ETU 70 Hz				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.4.4-1.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During time duration T1, T2, T3, T4 and T5 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 1 ms.

If the UE stops reporting the CQI before Point F (420 ms after the start of the time duration T5), the UE fails the tests.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

7.3.5.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.5.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331, the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.5.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX}$ and $T_{Evaluate\_}Q_{in\_DRX}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.5.

7.3.5.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the DRX cycle length, number of transmit antennas and the propagation conditions. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.5.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

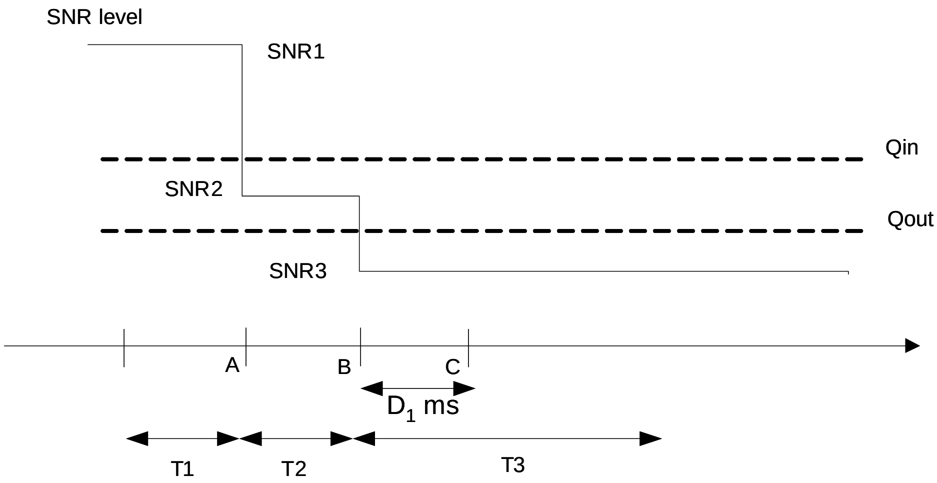

Figure 7.3.5.4-1: SNR variation for out-of-sync testing in DRX

7.3.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.10
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders)

2. The general test parameter settings for the different subtests are set up according to Table 7.3.5.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.5.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.5.4.1-1: General test parameters for E-UTRAN FDD out-of-sync in DRX testing

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			R.7 FDD	R.6 FDD	As specified in section A.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	OP.2 FDD	As specified in section D.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF Channel Number			1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	10	
Correlation Matrix and Antenna Configuration			2x2 Low	1x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
Out of sync transmission parameters (Note 1)	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	8	
	ρ_A, ρ_B		-3	0	
	Ratio of PDCCH to RS EPRE	dB	1	4	
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table 7.3.5.5-2
Layer 3 filtering			Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	Minimum CQI reporting periodicity
Propagation channel			ETU 70 Hz	AWGN	.
T1		s	4	32	
T2		s	1.6	12.8	
T3		s	1.8	13	
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.					

7.3.5.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 7.3.5.5-1 for subtest 1 and 2. Propagation conditions are set according to Annex B clause B.2.2 for subtests 1 and according to B.1.1 for subtests 2. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.5.5-1 for subtests 1 and 2. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.5.5-1 for subtests 1 and 2. T3 starts.

5. For subtest 1: If the SS stops receiving CQI reports within D_1 = 900 ms from the start of T3 the number of successful tests is increased by one, otherwise the number of failed tests is increased by one.
   For subtest 2: If the SS stops receiving CQI reports within D_1 = 6500 ms from the start of T3 the number of successful tests is increased by one, otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.5.5-1 for subtests 1 and 2.

7. If the UE has not reestablished the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.5.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-1

Table 7.3.5.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.5.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		

Table 7.3.5.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		

Table 7.3.5.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 7.3.5.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.5.5 Test requirement

Table 7.3.5.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			1x2 Low		
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD			OP.2 FDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA[Note1]	dB						
OCNG_RB[Note1]	dB						
SNR[Note 6]	dB	-1.4	-5.3	-13.1	-4.1	-8.9	-14.1
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.5.4-1.

Table 7.3.5.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 7.3.5.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In subtest 1 and subtest 2 during time duration T1 and T2 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

In subtest 1 the UE shall stop reporting the CQI within duration D_1 = 900 ms from the start of the time duration T3.

In subtest 2 the UE shall stop reporting the CQI within duration D_1 = 6500 ms from the start of the time duration T3.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

7.3.6.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

7.3.6.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331, the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.6.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.6.

7.3.6.4 Test description

The test consists of one subtest with one cell configured. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.6.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

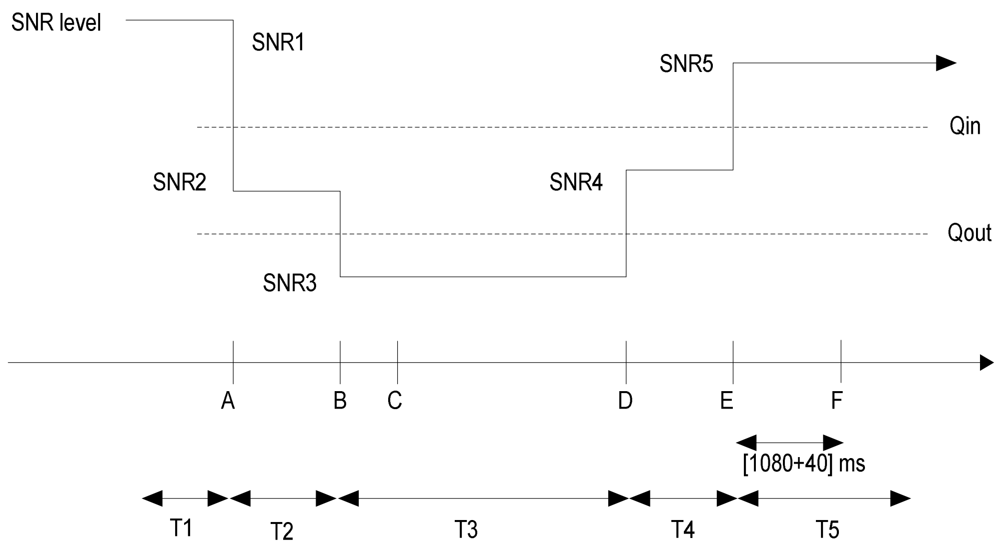

Figure 7.3.6.4-1: SNR variation for in-sync testing in DRX

7.3.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.
2. The general test parameter settings for the test is set up according to Table 7.3.6.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.6.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.6.4.1-1: General test parameters for E-UTRAN FDD in-sync in DRX testing

<table>
<tr><th colspan="2">Parameter</th><th>Unit</th><th>Value</th><th>Comment</th></tr>
<tr><td colspan="2">PCFICH/PDCCH/PHICH parameters</td><td></td><td>R.6 FDD</td><td>As specified in section A.2.1. None of the PDCCH are intended for the UE under test</td></tr>
<tr><td colspan="2">OCNG parameters</td><td></td><td>OP.2 FDD</td><td>As specified in section D.1.2.</td></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1</td><td>Cell 1 is on E-UTRA RF channel number 1</td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td></td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>One E-UTRA FDD carrier frequency is used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth ($BW_{channel}$)</td><td>MHz</td><td>10</td><td></td></tr>
<tr><td colspan="2">Correlation Matrix and Antenna Configuration</td><td></td><td>1x2 Low</td><td>Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2</td></tr>
<tr><td rowspan="6">In sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1C</td><td>As defined in section 5.3.3.1.4 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td rowspan="5">In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133in section and Table 7.6.1-2 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>4</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>0</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td></td><td>0</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td></td><td>4</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>As defined in section 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td rowspan="5">Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>0</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>4</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>4</td></tr>
<tr><td colspan="2">DRX cycle</td><td>ms</td><td>40</td><td>See Table 7.3.6.5-2</td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>2000</td><td>T310 is enabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213.</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>2</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">Propagation channel</td><td></td><td>AWGN</td><td></td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>4</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>1.6</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>1.46</td><td></td></tr>
<tr><td colspan="2">T4</td><td>s</td><td>0.4</td><td></td></tr>
<tr><td colspan="2">T5</td><td>s</td><td>4</td><td></td></tr>
<tr><td colspan="5">Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.6.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 2 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 7.3.6.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.6.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.6.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.6.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.6.5-1. T5 starts.
7. If the SS stops receiving CQI reports during T1 to T5 once every DRX cycle the number of failed tests is increased by one, otherwise the number of successful tests is increased by one .
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.6.4.3-1: Common Exception messages for E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-2

Table 7.3.6.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1A in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.6.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		

Table 7.3.6.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 7.3.6.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.6.5 Test requirement

Table 7.3.6.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Correlation Matrix and Antenna Configuration		1x2 Low				
OCNG Pattern defined in D.1 (FDD)		OP.2 FDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA Note1	dB					
OCNG_RB Note1	dB					
SNR Note 6	dB	-4.1	-8.9	-14.1	-9.3	-4.1
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.6.4-1.

Table 7.3.6.5-2: DRX-Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.6.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	[0]	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the entire test from time period T1 to T5 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

7.3.7.1 Test purpose

The purpose of this test is to verify that the UE properly detects the out of sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.7.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.7.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 .

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.7.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_}Q_{out\_DRX}$ and $T_{Evaluate\_}Q_{in\_DRX}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.7.

7.3.7.4 Test description

The test consists of two subtests with one cell configured; the difference between the subtests is the DRX cycle length, number of transmit antennas and the propagation conditions. Each subtest consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure 7.3.7.4-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

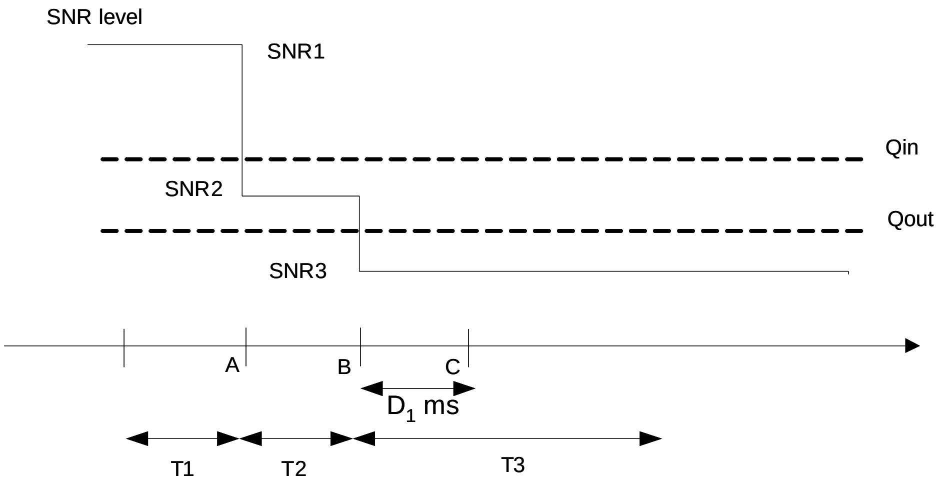

Figure 7.3.7.4-1: SNR variation for out-of-sync testing in DRX

7.3.7.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources or faders to the UE antenna connectors as stated below.
   For subtest 1: As Shown in TS 36.508 [7] Annex A figure A.10
   For subtest 2: As Shown in TS 36.508 [7] Annex A figure A.9 (without using the faders)
2. The general test parameter settings for the different subtests are set up according to Table 7.3.7.4-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 7.3.7.4.3
5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.7.4.1-1: General test parameters for E-UTRAN TDD out-of-sync in DRX testing

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Value</th><th rowspan="2">Comment</th></tr>
<tr><th>Test 1</th><th>Test 2</th></tr>
<tr><td colspan="2">PCFICH/PDCCH/PHICH parameters</td><td></td><td>R.7 TDD</td><td>R.6 TDD</td><td>As specified in section A.2.2.
None of the PDCCH are intended for the UE under test</td></tr>
<tr><td colspan="2">OCNG parameters</td><td></td><td>OP.2 TDD</td><td>OP.2 TDD</td><td>As specified in section D.2.2.</td></tr>
<tr><td colspan="2">Active cell</td><td></td><td>Cell 1</td><td>Cell 1</td><td>Cell 1 is on E-UTRA RF channel number 1</td></tr>
<tr><td colspan="2">CP length</td><td></td><td>Normal</td><td>Normal</td><td></td></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>1</td><td>One E-UTRA TDD carrier frequency is used.</td></tr>
<tr><td colspan="2">E-UTRA Channel Bandwidth ($BW_{channel}$)</td><td>MHz</td><td>10</td><td>10</td><td></td></tr>
<tr><td colspan="2">Correlation Matrix and Antenna Configuration</td><td></td><td>2x2 Low</td><td>1x2 Low</td><td>Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2</td></tr>
<tr><td rowspan="6">Out of sync transmission parameters (Note 1)</td><td>DCI format</td><td></td><td>1A</td><td>1A</td><td>As defined in section 5.3.3.1.3 in TS 36.212</td></tr>
<tr><td>Number of Control OFDM symbols</td><td></td><td>2</td><td>2</td><td rowspan="5">Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.</td></tr>
<tr><td>Aggregation level</td><td>CCE</td><td>8</td><td>8</td></tr>
<tr><td>ρ_A, ρ_B</td><td></td><td>-3</td><td>0</td></tr>
<tr><td>Ratio of PDCCH to RS EPRE</td><td>dB</td><td>1</td><td>4</td></tr>
<tr><td>Ratio of PCFICH to RS EPRE</td><td>dB</td><td>1</td><td>4</td></tr>
<tr><td colspan="2">DRX cycle</td><td>ms</td><td>40</td><td>1280</td><td>See Table 7.3.7.5-2</td></tr>
<tr><td colspan="2">Layer 3 filtering</td><td></td><td>Enabled</td><td>Enabled</td><td>Counters:
N310 = 1; N311 = 1</td></tr>
<tr><td colspan="2">T310 timer</td><td>ms</td><td>0</td><td>0</td><td>T310 is disabled</td></tr>
<tr><td colspan="2">T311 timer</td><td>ms</td><td>1000</td><td>1000</td><td>T311 is enabled</td></tr>
<tr><td colspan="2">Periodic CQI reporting mode</td><td></td><td>PUCCH 1-0</td><td>PUCCH 1-0</td><td>As defined in table 7.2.2-1 in TS 36.213.</td></tr>
<tr><td colspan="2">CQI reporting periodicity</td><td>ms</td><td>1</td><td>1</td><td>Minimum CQI reporting periodicity</td></tr>
<tr><td colspan="2">Propagation channel</td><td></td><td>ETU 70 Hz</td><td>AWGN</td><td>.</td></tr>
<tr><td colspan="2">T1</td><td>s</td><td>4</td><td>32</td><td></td></tr>
<tr><td colspan="2">T2</td><td>s</td><td>1.6</td><td>12.8</td><td></td></tr>
<tr><td colspan="2">T3</td><td>s</td><td>1.8</td><td>13</td><td></td></tr>
<tr><td colspan="6">Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.</td></tr>
</table>

7.3.7.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 7.3.7.5-1 for subtest 1 and 2. Propagation conditions are set according to Annex B clause B.2.2 for subtests 1 and according to B.1.1 for subtests 2. T1 starts.

3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.7.5-1 for subtests 1 and 2. T2 starts.

4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.7.5-1 for subtests 1 and 2. T3 starts.

5. For subtest 1: If the SS stops receiving CQI reports within D_1 = 900 ms from the start of T3 the number of successful tests is increased by one, otherwise the number of failed tests is increased by one.
For subtest 2: If the SS stops receiving CQI reports within D_1 = 6500 ms from the start of T3 the number of successful tests is increased by one, otherwise the number of failed tests is increased by one.

6. When T3 expires the SS shall change the SNR value to T1 as specified in Table 7.3.7.5-1 for subtests 1 and 2.

7. If the UE has not reestablished the connection in at least 1s, the UE is switched off and then on. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.7.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.7.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-1

Table 7.3.7.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.7.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		

Table 7.3.7.4.3-4: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #2 requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_DRX_L
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		

Table 7.3.7.4.3-5: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 7.3.7.4.3-6: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX, subtest #1 and #2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.7.5 Test requirement

Table 7.3.7.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring subtests #1 and # 2

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel Number		1			1		
$BW_{channel}$	MHz	10			10		
Correlation Matrix and Antenna Configuration		2x2 Low			1x2 Low		
Special subframe configuration Note1		6			6		
Uplink-downlink configuration Note2		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD			OP.2 TDD		
ρ_A, ρ_B		-3			0		
PCFICH_RB	dB	1			4		
PDCCH_RA	dB	-3			0		
PDCCH_RB	dB	-3			0		
PBCH_RA	dB	-3			0		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note1	dB						
OCNG_RB Note1	dB						
SNR Note 8	dB	-1.4	-5.0	-12.8	-4.5	-8.5	-13.7
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		ETU 70 Hz			AWGN		

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure 7.3.7.4-1.

Table 7.3.7.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	Disable	

Table 7.3.7.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring out-of-sync in DRX test

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In test 1 and test 2 during time duration T1 and T2 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

In test 1 the UE shall stop reporting the CQI within duration D_1 = [900] ms from the start of the time duration T3.

In test 2 the UE shall stop reporting the CQI within duration D_1 = [6500] ms from the start of the time duration T3.

The rate of correct events observed during repeated tests shall be at least 90%.

7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

7.3.8.1 Test purpose

The purpose of this test is to verify that the UE properly detects the in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in TS 36.133 section 7.6.

7.3.8.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

7.3.8.3 Minimum conformance requirements

When DRX is used the Q_{out} evaluation period ($T_{Evaluate\_}Q_{out\_DRX}$) and the Q_{in} evaluation period ($T_{Evaluate\_}Q_{in\_DRX}$) is specified in TS 36.133 [4] Table 7.6.2.2-1 will be used.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{out\_DRX}$ [s] period becomes worse than the threshold Q_{out}, Layer 1 of the UE shall send out-of-sync indication to the higher layers within $T_{Evaluate\_}Q_{out\_DRX}$ [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in TS 36.331 [5] clause 5.5.3.2.

When the downlink radio link quality estimated over the last $T_{Evaluate\_}Q_{in\_DRX}$ [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications to the higher layers within $T_{Evaluate\_}Q_{in\_DRX}$ [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in TS 36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS 36.213 [8]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in TS 36.331 [5], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry of T310 timer.

The transmitter power shall be turned off within 40 ms after expiry of T310 counter as specified in TS 36.331 [5] section 5.3.11.

Table 7.3.8.3-1: Q_{out} and Q_{in} Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate\_Q_{out\_DRX}}$ and $T_{Evaluate\_Q_{in\_DRX}}$ (s) (DRX cycles)
≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the DRX cycle in use	

The normative reference for this requirement is TS 36.133 [4] clause 7.6.2 and A.7.3.8.

7.3.8.4 Test description

The test consists of one subtest with one cell configured. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure 7.3.8.4-1 shows the different time durations and the corresponding variation of the downlink SNR in the active cell to emulate in-sync states.

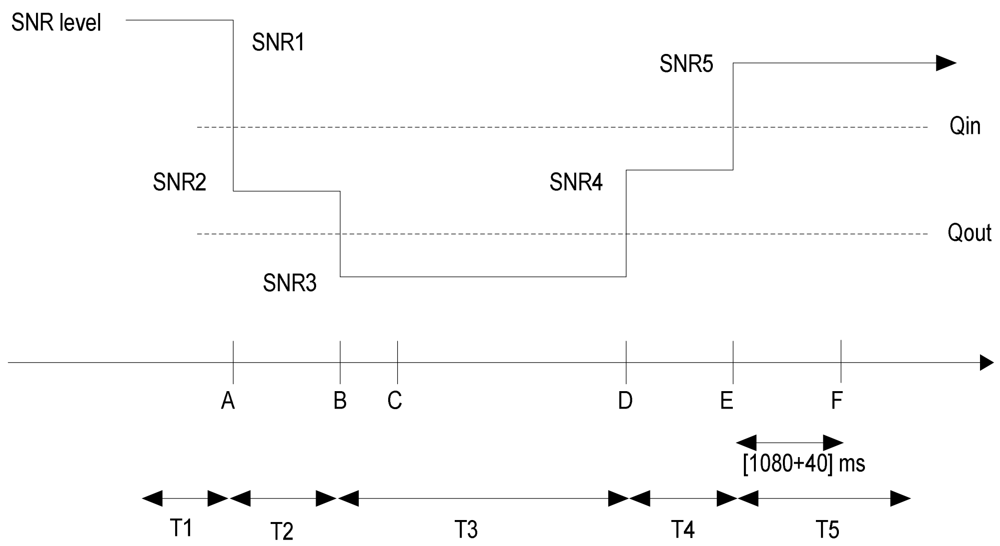

Figure 7.3.8.4-1: SNR variation for in-sync testing in DRX

7.3.8.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1 Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.

2. The general test parameter settings for the test is set up according to Table 7.3.8.4-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 7.3.8.4.3

5. There is one cell specified in this test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 7.3.8.4.1-1: General test parameters for E-UTRAN TDD in-sync in DRX testing

Parameter		Unit	Value	Comment
PCFICH/PDCCH/PHICH parameters			R.6 TDD	As specified in section A.2.2. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 TDD	As specified in section D.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)		MHz	10	
Correlation Matrix and Antenna Configuration			1x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.521-1 [10] Annex B.2.3.2
In sync transmission parameters (Note 1)	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
	Number of Control OFDM symbols		2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133in section and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE		0	
	Ratio of PCFICH to RS EPRE		4	
Out of sync transmission parameters (Note 1)	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
	Number of Control OFDM symbols		2	Out of sync threshold Q_{out} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS 36.133 in section 7.6.1 and Table 7.6.1-1 respectively.
	Aggregation level	CCE	8	
	ρ_A, ρ_B		0	
	Ratio of PDCCH to RS EPRE	dB	4	
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table 7.3.8.5-2
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		s	4	
T2		s	1.6	
T3		s	1.46	
T4		s	0.4	
T5		s	4	
Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.				

7.3.8.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 7.3.8.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.
3. When T1 expires the SS shall change the SNR value to T2 as specified in Table 7.3.8.5-1. T2 starts.
4. When T2 expires the SS shall change the SNR value to T3 as specified in Table 7.3.8.5-1. T3 starts.
5. When T3 expires the SS shall change the SNR value to T4 as specified in Table 7.3.8.5-1. T4 starts.
6. When T4 expires the SS shall change the SNR value to T5 as specified in Table 7.3.8.5-1. T5 starts.
7. If the SS stops receiving CQI reports during T1 to T5 once every DRX cycle the number of failed tests is increased by one, otherwise the number of successful tests is increased by one .
8. Repeat steps 2-7 for all subtests until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

7.3.8.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 7.3.8.4.3-1: Common Exception messages for E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.2.4-2

Table 7.3.8.4.3-2: *CQI-ReportConfig-DEFAULT:* Additional E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
CQI-ReportConfig-DEFAULT ::= SEQUENCE {			
cqi-ReportPeriodic	ON		
cqi-ReportPeriodic ::= CHOICE {			CQI_PERIODIC
setup SEQUENCE {			
cqi-PUCCH-ResourceIndex	0		
cqi-pmi-ConfigIndex	0	(see Table 7.2.2-1C in TS 36.213)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	483	(see Table 7.2.2-1B in TS 36.213)	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

Table 7.3.8.4.3-3: *MAC-MainConfig-RBC*: E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			pc_FeatrGrp_5 AND DRX_S
Setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	2		
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	infinity		

Table 7.3.8.4.3-4: *PhysicalConfigDedicated-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Table 7.3.8.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD Radio Link Monitoring test for In-sync in DRX requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

7.3.8.5 Test requirement

Table 7.3.8.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for In-sync radio link monitoring test

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number		1				
$BW_{channel}$	MHz	10				
Correlation Matrix and Antenna Configuration		1x2 Low				
Special subframe configuration[Note1]		6				
Uplink-downlink configuration[Note2]		1				
OCNG Pattern defined in D.2 (TDD)		OP.2 TDD				
ρ_A, ρ_B		0				
PCFICH_RB	dB	4				
PDCCH_RA	dB	0				
PDCCH_RB	dB	0				
PBCH_RA	dB	0				
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA[Note1]	dB					
OCNG_R B[Note1]	dB					
SNR [Note 8]	dB	-4.5	-8.5	-13.7	-9.7	-4.5
N_{oc}	dBm/15 kHz	-98				
Propagation condition		AWGN				

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure 7.3.8.4-1.

Table 7.3.8.5-2: DRX-Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table 7.3.8.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD Radio Link Monitoring in-sync in DRX test

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the entire test from time period T1 to T5 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

The rate of correct events observed during repeated tests shall be at least 90%.

8 UE Measurements Procedures

When the UE is in RRC_CONNECTED state on a cell, UE reports measurement information in accordance with the measurement configuration as provided by the System Simulator. To initiate a specific measurement, the System Simulator sends a ‘RRC Connection Reconfiguration message’ to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), after that the measurement reporting process takes place. In this process when the reporting criteria are fulfilled the UE sends a ‘Measurement Report message’ to the System Simulator including the measurement ID and the results. The reporting criteria that trigger the UE to send a ‘Measurement Report message’ to the System Simulator is event-triggered as defined in TS 36.331 [5] clause 5.5.3. The measurement reporting succeeds only if the measurement report is sent within the specified measurement reporting delay period.

The reference channels in this section assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified. SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.

Uplink is configured according to Annex A.3.

8.1 E-UTRAN FDD intra frequency measurements

8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.1.1.1 Test purpose

To verify the UE’s ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.1.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

Where:

$T_{basic\_identify\_E\text{-}UTRA\_FDD,\ intra}$ is 800 ms.

$T_{Measurement\_Period,Intra}$ = 200 ms. The measurement period for intra-frequency RSRP measurements.

T_{Intra}: This is the minimum time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP $|_{dBm} \geq$ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot $\geq$ - 6 dB,
- SCH_RP $|_{dBm} \geq$ -126 dBm for Band 9 and SCH Ês/Iot $\geq$ - 6 dB,

- SCH_RP $|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot ≥ - 6 dB,
- SCH_RP SCH_RP $|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês/Iot ≥ - 6 dB.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated, the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells, where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements of all identified cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement FDD}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

Where:

$X_{basic\ measurement\ FDD}$ = 8 (cells).

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for intra-frequency RSRP measurements.

T_{Intra}: This is the time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra- frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected. The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.1.

8.1.1.4 Test description

8.1.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.1.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.1.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.1.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.1.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, wi or retransmissions th time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.1.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7

Table 8.1.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.1.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServiCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.1.5 Test requirement

Tables 8.1.1.4.1-1 and 8.1.1.5-1 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in asynchronous cells test.

Table 8.1.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_PB	dB				
PDCCH_RA	dB				
PDCCH_PB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4	-0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-94	-91.90	-Infinity	-91.90
SCH_RP Note 4	dBm/15 KHz	-94	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells

8.1.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.1.2.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify\_intra}$ in RRC_CONNECTED state.

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{\text{identify intra}} = T_{\text{basic identify } E-UTRA\_\text{FDD, intra}} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}} \quad ms$$

Where:

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$ is 800 ms.

$T_{Measurement\_Period,Intra}$ = 200 ms. The measurement period for intra-frequency RSRP measurements.

T_{Intra}: This is the minimum time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra-frequency measurements whenever the receiver is guaranteed to be active on the intra-frequency carrier.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP $|_{dBm} \geq$ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot $\geq$ 6 dB,
- SCH_RP $|_{dBm} \geq$ -126 dBm for Band 9 and SCH Ês/Iot > - 6 dB,
- SCH_RP $|_{dBm} \geq$ -125 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot > - 6 dB,
- SCH_RP SCH_RP $|_{dBm} \geq$-124 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês/Iot > - 6 dB.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra-frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP and RSRQ measurements for 8 identified intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated, the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells, where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathrm{Y}_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathrm{T}_{\text{Intra}}}{\mathrm{T}_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

Where:

$X_{\text{basic measurement FDD}}$ = 8 (cells).

$T_{\text{Measurement\_Period Intra}}$ = 200 ms. The measurement period for intra-frequency RSRP measurements.

T_{Intra}: This is the time that is available for intra-frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra- frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify intra}}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{\text{identify\_intra}}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{\text{Measurement\_Period Intra}}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.2.

8.1.2.4 Test description

8.1.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.1.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.2.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in clause A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in clause A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.1.2.5-2
Time offset between cells	μs	3	Synchronous cells 3μs or 92*Ts
T1	s	5	
T2	s	5	

8.1.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.1.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.2.5-1. T2 starts.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10.Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.1.2.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.2.4.3-3: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCell CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.2.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.2.5 Test requirement

Tables 8.1.2.4.1-1, 8.1.2.5-1, and 8.1.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.1.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

$\hat{E}_s/I_{ot}$	dB	4	-0.95	-Infinity	-0.95
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	6.10	-Infinity	6.10
RSRP Note 4	dBm/15 KHz	-94	-91.90	-Infinity	-91.90
SCH_RP Note 4	dBm/15 KHz	-94	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.1.2.5-2: Reference DRX-Configuration to be used in E-UTRAN FDD-FDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	sf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

8.1.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.1.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify\ intra}$ as defined in table 8.1.2.2.1.2-1 of TS 36.133 [4] clause 8.1.2.2.1.2.

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] clause 9.1 are fulfilled for a corresponding Band,
- SCH_RP $|_{dBm}$ ≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 20 and SCH Ês/Iot ≥ 6 dB,
- SCH_RP $|_{dBm}$≥ -126 dBm for Band 9 and SCH Ês/Iot > - 6 dB,
- SCH_RP $|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot > - 6 dB,
- SCH_RP SCH_RP $|_{dBm}$≥-124 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês/Iot > - 6 dB.

In the RRC_CONNECTED state with DRX cycles of 80 ms or greater the measurement period for intra frequency measurements is $T_{measure\_intra}$ as defined in table 8.1.2.2.1.2-2 of TS 36.133 [4] clause 8.1.2.2.1.2. The UE shall be capable of performing RSRP measurement for 8 identified intra frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] clause 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.3.

8.1.3.4 Test description

8.1.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.1.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.1.3.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.1.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	dB	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.1.3.5-2
Time offset between cells		3 µs		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.1.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.1.3.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.1.3.5-1 and 8.1.3.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 842 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.1.3.4.1-1 as appropriate.

8.1.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.1.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.1.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.1.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.1.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.1.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting in DRX under fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.1.3.5 Test requirement

Tables 8.1.3.4.1-1, 8.1.3.5-1, 8.1.3.5-2 and 8.1.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4	-0.95	-Infinity	-0.95
N_{oc} Note 2	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	6.10	-Infinity	6.10
RSRP Note 3	dBm/15 KHz	-94	-91.90	-Infinity	-91.90
SCH_RP Note 3	dBm/15 KHz	-94	-91.90	-Infinity	-91.90
Propagation Condition		ETU70			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.1.3.5-2: DRX Configuration to be used for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.1.3.5-3: TimeAlignmentTimer and sr-ConfigIndex-Configuration to be used for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	

TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5]
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 800 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 842 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.1.4 Void

8.2 E-UTRAN TDD intra frequency measurements

8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.2.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD-TDD intra frequency cell search requirements.

8.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

8.2.1.3 Minimum conformance requirements

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

$$\mathrm{T}_{\text{identify intra}} = \mathrm{T}_{\text{basic identify } E-UTRA\_\text{TDD, intra}} \cdot \frac{\mathrm{T}_{\text{Measurement Period, Intra}}}{\mathrm{T}_{\text{Intra}}} \quad ms$$

where

$T_{basic\_identify\_E\text{-}UTRA\_TDD,\ intra}$ is 800 ms

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP $|_{dBm} \geq$ -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot $\geq$ - 6 dB
- SCH_RP $|_{dBm} \geq$ -126 dBm for Band 41 and SCH Ês/Iot $\geq$ - 6 dB.

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency RSRP measurements.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement\_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{measurement\ intra}$ cells , where $Y_{measurement\ intra}$ is defined in the following equation. If the UE has identified more than $Y_{measurement\ intra}$ cells, the UE shall perform measurements at least 8 identified intra-frequency cells but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathrm{Y}_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement TDD}} \cdot \frac{\mathrm{T}_{\text{Intra}}}{\mathrm{T}_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

where

$X_{basic\ measurement\ TDD}$ = 8 (cells)

$T_{Measurement\_Period\ Intra}$ = 200 ms. The measurement period for Intra frequency RSRP measurements.

T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2.1 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period $\leq$ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than $\pm$ 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2 and A.8.1.2.

8.2.1.4 Test description

8.2.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.2.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.1.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.1.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211. The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in Table 8.2.1.5-2
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	5	

8.2.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.2.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.1.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-7 Table H.3.6-2

Table 8.2.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.1.4.3-3: MeasResults: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {		Report Cell 1	
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {		Report Cell 2	
physCellId	PhysCellId of the Cell 2		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.1.5 Test requirement

Tables 8.2.1.4.1-1, 8.2.1.5-1, and 8.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.2.1.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
OCNG Pattern defined in A.2.1 (OP.1 TDD) and in A.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-94	-91.40	-Infinity	-91.40
$\hat{E}_s/I_{ot}$	dB	4	-0.86	-Infinity	-0.86
SCH_RP	dBm/15 kHz	-94	-91.40	-Infinity	-91.40
$\hat{E}_s/N_{oc}$	dB	4	6.60	-Infinity	6.60
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

Table 8.2.1.5-2: Reference DRX-Configuration to be used in E-UTRAN TDD-TDD event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Value	Comments
Reference configuration	DRX_L	As defined in 4.8.2.1.5 in TS 36.508 [7.]
onDurationTimer	psf6	
drx-InactivityTimer	psf1920	
drx-RetransmissionTimer	sf16	
longDRX-CycleStartOffset	sf1280, 0	
shortDRX	disabled	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].		

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_TDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E-UTRA\_TDD,\ intra}$= 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

8.2.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD intra frequency cell search in DRX requirements.

8.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

8.2.2.3 Minimum conformance requirements

Note: The state when no DRX is used is assumed to be the one in which the DRX Inactivity Timer is running, and the state when DRX is used is assumed to be otherwise for this performance requirement.

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify\_intra}$ as shown in table 8.2.2.3-1

Table 8.2.2.3-1: Requirement to identify a newly detectable TDD intra frequency cell

DRX cycle length (s)	$T_{identify\_intra}$ (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04<DRX-cycle≤0.08	Note2 (40)
0.08<DRX-cycle≤2.56	Note2(20)
Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use	

A cell shall be considered detectable when

- RSRP related side condition given in TS 36.133 [4] Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP $|_{dBm} \geq$ -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40and SCH Ês/Iot $\geq$ - 6 dB.
- SCH_RP $|_{dBm} \geq$ -126 dBm Band 41 and SCH Ês/Iot $\geq$ - 6 dB.

In the RRC_CONNECTED state with DRX cycles of 80ms or greater the measurement period for intra frequency measurements is $T_{measure\_intra}$ as shown in table 8.2.2.3-2. The UE shall be capable of performing RSRP measurements for TS 45.008 [15] identified-intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure\_intra}$.

Table 8.2.2.3-2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	$T_{measure\_intra}$ (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04<DRX-cycle≤2.56	Note2 (5)
Note1: Number of DRX cycle depends upon the DRX cycle in use. Note2: Time depends upon the DRX cycle in use.	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.2.2.2.1.3 Event Triggered Reporting.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}.This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_intra}$ defined in TS 36.133 [4] Section 8.1.2.2.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.2.2 and A.8.2.2.

8.2.2.4 Test description

8.2.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.2.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.2.2.4.3.
5. There is one E-UTRA TDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.2.2.4.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211[9]. The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211[9]. The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	s	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in Table 8.2.2.4-2
Time offset between cells	µs	3		Synchronous cells 3µs or 92*Ts
T1	s	5		
T2	s	5	30	

8.2.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time aligment timer to keep UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time aligment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 8.2.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.2.2.5-1.
6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 842 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
11. Repeat step 1-10 for each sub-test in Table 8.2.2.4.1-1 as appropriate.

8.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.2.2.4.3-1: Common Exception messages for E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-2 Table H.3.1-7

Table 8.2.2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		MEAS
radioResourceConfigDedicated SEQUENCE {			
MAC-MainConfig-RBC SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {			
sf40	9	For Test 1	
sf1280	9	For Test 2	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		
PhysicalConfigDedicated SEQUENCE {			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			
}			
}			
}			
}			

Table 8.2.2.4.3-3: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.2.4.3-4: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.2.2.4.3-5: MeasResults: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.2.2.4.3-6: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
1 entry physCellId	PhysCellId	INTEGER (0..503) of Cell 2	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.2.2.5 Test requirement

Tables 8.2.2.5-1, 8.2.2.5-2 and 8.2.2.5-3 defines the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.2.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		1	
$BW_{channel}$	MHz	10		10	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-91.40	-Infinity	-91.40
$\hat{E}_s/I_{ot}$	dB	4	-0.86	-Infinity	-0.86
SCH_RP Note 3	dBm/15 kHz	-94	-91.40	-Infinity	-91.40
$\hat{E}_s/N_{oc}$	dB	4	6.60	-Infinity	6.60
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.2.2.5-2: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in 3GPP TS 36.331
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.2.2.5-3: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section 10.1 in 3GPP TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI$_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 800 ms. When DRX cycle length is 40 ms then the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 842 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_intra}$

$T_{identify\_intra}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_intra}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3 E-UTRAN FDD-FDD Inter-frequency Measurements

8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

8.3.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in asynchronous cells within the E-UTRA FDD inter-frequency cell search requirements. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

8.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.3.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP$|_{dBm}$≥ -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}$≥ -124 dBm for Bands 9 and RSRP Ês/Iot ≥ -4 dB,

- $RSRP|_{dBm} \geq$ -123 dBm for Bands 2, 5, 7, 17 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm} \geq$ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm} \geq$ -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot ≥ -4 dB,
- $SCH\_RP|_{dBm} \geq$ -124 dBm for Band 9 and SCH Ês/Iot ≥ -4 dB,
- $SCH\_RP|_{dBm} \geq$ -123 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot ≥ -4 dB,
- $SCH\_RP|_{dBm} \geq$ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês /Iot ≥ -4 dB.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period given by table 8.3.1.3-1.

Table 8.3.1.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional.		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.1.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.1.

8.3.1.4 Test description

8.3.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.3.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.1.4.3.

5. There are two E-UTRA FDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.1.4.1-1: General test parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
T1	s	5	
T2	s	5	

8.3.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.3.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit a RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.1.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.3.1.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.3.1.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.1.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.3.1.5 Test requirement

Tables 8.3.1.4.1-1 and 8.3.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.3.1.5-1: Cell specific test requirement parameters for E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
SCH_RP	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3842 ms from the beginning of time period T2.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = 3840 ms

TTI insertion uncertainty = TTI_{DCCH} = 1 ms; 2xTTI_{DCCH} = 2 ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

8.3.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter frequency cell search requirements.

8.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.3.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ as shown in table 8.3.2.3-1:

Table 8.3.2.3-1: Requirement to identify a newly detectable FDD inter-frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.256	5.12*N_{freq} (20*N_{freq})	7.68*N_{freq} (30*N_{freq})
0.32	6.4*N_{freq} (20*N_{freq})	7.68*N_{freq} (24*N_{freq})
0.32 < DRX-cycle ≤ 2.56	Note (20*N_{freq})	Note (20*N_{freq})
Note: Time depends upon the DRX cycle in use		

The non DRX requirements in TS 36.133 [4] clause 8.1.2.3.1.1 states that when measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\ Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{Inter1} is defined in TS36.133 [4] section 8.1.2.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|dBm≥ -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21 and RSRP Ês/Iot ≥ -4 dB,
- RSRP|dBm≥ -124 dBm for Bands 9 and RSRP Ês/Iot ≥ -4 dB,
- RSRP|dBm≥ -123 dBm for Bands 2, 5, 7, 17 and RSRP Ês/Iot ≥ -4 dB,
- RSRP|dBm≥ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,

- SCH_RP$|_{dBm}$≥ -125 dBm for Bands 1, 4, 6, 10 11, 18, 19, 21 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP$|_{dBm}$≥ -124 dBm for Band 9 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}$≥ -123 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}$≥ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês/Iot ≥ -4 dB.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.3.2.3-2.

Table 8.3.2.3-2: Requirement to measure FDD inter-frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in TS 36.133 [4] clause 8.1.2.3.1.1 are applicable
0.08 < DRX-cycle ≤ 2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in TS 36.133 [4] clause 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.2.

8.3.2.4 Test description

8.3.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.2.4.3.

5. There are two E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.2.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
E-UTRA RF Channel Number		1, 2		Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.3.2.5-2
Time offset between cells		3 ms		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	5	30	

8.3.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.3.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 or less than 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Repeat step 1-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 for each sub-test in Table 8.3.2.4.1-1 as appropriate.

8.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.2.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.3.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject- f3		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.3.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.2.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.2.4.3-5: *MeasResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.2.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test 1 and 2 requirements

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.3.2.5 Test requirement

Tables 8.3.2.4.1-1, 8.3.2.5-1, 8.3.2.5-2 and 8.3.2.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells test.

Table 8.3.2.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA [Note 1]	dB				
OCNG_RB [Note 1]	dB				

N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.3.2.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.3.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

In Test 1 when DRX cycle length = 40 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty+ DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delays measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as definded in Table 8.3.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delays measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

8.3.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when L3 filtering is used in AWGN propagation conditions in asynchronous cells within the E-UTRA FDD-FDD inter frequency cell search in DRX requirements and the UE behaviour with the filterCoefficent.

8.3.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.3.3.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable FDD inter frequency cell within $T_{identify\ inter}$ as defined in table 8.1.2.3.1.2-1 of TS 36.133 [4] clause 8.1.2.3.1.2.

A cell shall be considered detectable when

- RSRP $|_{dBm}$ > -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21 and RSRP Ês/Iot ≥ -4 dB,

- RSRP $|_{dBm}$ > -124 dBm for Bands 9 and RSRP Ês/Iot ≥ -4 dB,
- RSRP $|_{dBm}$ > -123 dBm for Bands 2, 5, 7, 17 and RSRP Ês/Iot ≥ -4 dB,
- RSRP $|_{dBm}$ > -122 dBm for Bands 3, 8, 12, 13, 14, 20 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side condition given in TS 36.133 [4] clause 9.1 are fulfilled,
- SCH_RP $|_{dBm}$ ≥ -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}$≥ -124 dBm for Band 9 and SCH Ês/Iot > - 4 dB,
- SCH_RP $|_{dBm}$≥ -123 dBm for Bands 2, 5, 7, 11, 17 and SCH Ês/Iot > - 4 dB,
- SCH_RP $|_{dBm}$≥-122 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês/Iot > - 4 dB.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement priod defined in table 8.3.3.3-1.

Table 8.3.3.3-1: Requirement to measure FDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.08	Non DRX Requirements in section 8.1.2.3.1.1 in 3GPP TS 36.133 [4] are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_ inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.3.3.

8.3.3.4 Test description

8.3.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 8.3.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.3.3.4.3.

5. There is one E-UTRA FDD carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.3.3.4.1-1: General Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	dB	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table 8.3.3.5-2
Time offset between cells		3 ms	Asynchronous cells
T1	s	30	
T2	s	7	

8.3.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively.

In the Test when DRX = 1280 ms is used, a non-zero L3 filtering is configured. The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.3.3.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.3.3.5-1 and 8.3.3.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 7682 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.3.4.1-1 as appropriate.

8.3.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.3.3.4.3-1: Common Exception messages for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-3 Table H.3.7-2 Table H.3.7-3

Table 8.3.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.3.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used in test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventid CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	0 (0 dB)	The actual value is IE value * 0.5 dB IE Value INTEGER (-30.. 30)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	The actual value is IE value * 0.5 dB	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.3.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.3.3.4.3-5: *MeaResults*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.3.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

Table 8.3.3.4.3-7: *FilterCoefficient*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
filterCoefficient	fc9		

Table 8.3.3.4.3-8: *MeasObjectEUTRA-GENERIC(Freq)*: Additional E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-2 MeasObjectEUTRA-GENERIC(Freq)			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasObjectEUTRA-GENERIC(Freq) ::= SEQUENCE {			
carrierFreq	Downlink EARFCN for Freq		
allowedmeasBandwidth	The number of the resource blocks for Freq		
presenceAntennaPort1	FALSE		
neighCellConfig	'10'B (The MBSFN subframe allocations of all neighbour cells are identical to or subsets of that in the serving cells)		
offsetFreq	-14 (dB-14)	-14 dB is actual value in dB (Value dB-14 corresponds to -14 dB)	
cellsToRemoveList	Not present		
cellsToAddModList	Not present		
blackCellsToRemoveList	Not present		
blackCellsToAddModList	Not present		
cellForWhichToReportCGI	Not present		
}			

8.3.3.5 Test requirement

Tables 8.3.3.4.1-1, 8.3.3.5-1, 8.3.3.5-2 and 8.3.3.5-3 define the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used test.

Table 8.3.3.5-1: Cell Specific Test Parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4.00	1.80	4.00	24.00
N_{oc} Note 2	dBm/15 KHz	-96.90	-96.90	-98.00	-98.00
$\hat{E}_s/N_{oc}$	dB	4.00	1.80	4.00	24.00
RSRP Note 3	dBm/15 KHz	-92.90	-95.10	-94.00	-74.00
SCH_RP Note 3	dBm/15 KHz	-92.90	-95.10	-94.00	-74.00
Propagation Condition		AWGN			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.3.3.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table 8.3.3.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 [5] and section 10.1 in 3GPP TS 36.213 [8].

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{measure\_inter}$

$T_{measure\_inter}$ = 6400 ms. When DRX cycle length is 1280 ms then the $T_{measure\_inter}$ is 5 x 1280 ms, as defined in Table 8.3.3.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 7682 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.4 E-UTRAN TDD-TDD inter frequency measurements

8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

8.4.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells within the E-UTRA TDD inter-frequency cell search requirements. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

8.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

8.4.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm} \geq$ -125 dBm and for Bands 33, 34, 35, 36, 37, 38, 39, 40 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm} \geq$ -124 dBm for Band 41 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm} \geq$ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot ≥ -4 dB.
- $SCH\_RP|_{dBm} \geq$ -124 dBm for Band 41 and RSRP Ês/Iot ≥ -4 dB,

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.4.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2 and A.8.4.1.

8.4.1.4 Test description

8.4.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.4.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.1.4.3.

5. There are two E-UTRA TDD carriers and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.1.4.1-1: General test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	µs	3	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.4.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.4.1.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.1.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the measurement reporting delay from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the

UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit an RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.1.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H3.1-1 Table H3.1-3 Table H.3.1-7

Table 8.4.1.4.3-2: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.1.4.3-3: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.1.4.3-4: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test INTEGER(0..97)	
rsrqResult		Set according to specific test INTEGER(0..34)	
}			
}			

8.4.1.5 Test requirement

Tables 8.4.1.4.1-1 and 8.4.1.5-1 define the primary level settings including test tolerances for event triggered reporting under fading propagation conditions in asynchronous inter frequency cells test.

Table 8.4.1.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-91
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 7682 ms in this test case (note: a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

1) NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells

8.4.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions in synchronous cells with DRX within the E-UTRA TDD-TDD inter frequency cell search in DRX requirements.

8.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

8.4.2.3 Minimum conformance requirements

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify\_inter}$ as shown in table 8.4.2.3-1.

Table 8.4.2.3-1: Requirement to identify a newly detectable TDD inter frequency cell

DRX cycle length (s)	$T_{identify\_inter}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.16	Non DRX Requirements in section 8.1.2.3.2.1 are applicable	Non DRX Requirements in section 8.1.2.3.2.1 are applicable
0.256	5.12*Nfreq (20*Nfreq)	7.68*Nfreq (30*Nfreq)
0.32	6.4*Nfreq (20*Nfreq)	7.68*Nfreq (24*Nfreq)
0.32<DRX-cycle≤2.56	Note (20*Nfreq)	Note (20*Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm}$≥ -125 dBm and for Bands 33, 34, 35, 36, 37, 38, 39, 40 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm}$ ≥ -124 dBm for Band 41 and RSRP Ês/Iot ≥ -4 dB,
- RSRP related side conditions given in TS 36.133 [4] Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm}$≥ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot ≥ -4 dB.
- $SCH\_RP|_{dBm}$ ≥ -124 dBm for Band 41 and RSRP Ês/Iot ≥ -4 dB,

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.4.2.3-2.

Table 8.4.2.3-2: Requirement to measure TDD inter frequency cells

DRX cycle length (s)	$T_{measure\_inter}$ (s) (DRX cycles)
≤0.84	Non DRX Requirements in section 8.1.2.3.1.1 are applicable
0.08<DRX-cycle≤2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] sub-clause 9.1.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] Section 8.1.2.3.2.2 When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.2 and A.8.4.2.

8.4.2.4 Test description

8.4.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.4.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.4.2.4.3.

5. There are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in TS 36.133[4] Table 8.1.2.1-1 is provided. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.4.2.4.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
E-UTRA RF Channel Number		1, 2		Two TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10		
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.4.2.4.1-2
Time offset between cells	μs	3		Synchronous cells 3μs or 92*Ts
T1	s	5		
T2	s	5	30	

8.4.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time aligment timer to keep UE uplink time aligmend. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time aligment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.4.2.5-1. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.4.2.5-1.

6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 3882 ms for Test 1 and 26882 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.4.2.4.1-1 as appropriate.

8.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.4.2.4.3-1: Common Exception messages for Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.4.2.4.3-2: RRCConnectionReconfiguration: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
	MeasConfig-DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated- HO		
}			
}			
}			
}			

Table 8.4.2.4.3-3: MeasConfig-DEFAULT: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.4.2.4.3-4: ReportConfigEUTRA-A3: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-A3 ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-12 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.4.2.4.3-5: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.4.2.4.3-6: MeasResults: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)	Set according to specific test	
rsrqResult	INTEGER(0..34)	Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.4.2.4.3-7: MeasResultListEUTRA: Additional E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.4.2.5 Test requirement

Tables 8.4.2.5-1, 8.4.2.5-2 and 8.4.2.5-3 define the primary level settings including test tolerances for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used test.

Table 8.4.2.5-1: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
N_{oc} Note 2	dBm/15 kHz	-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.4.2.5-2: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.4.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

In Test1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.TTI insertion uncertainty = 2 ms

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{Identify\_Inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{Inter1} = 60 ms. It is defined in table 8.1.2.1-1 of TS36.133 [4] clause 8.1.2.1.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3882 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_inter}$

$T_{identify\_inter}$ = 25600 ms. When DRX cycle length is 1280 ms then the $T_{identify\_inter}$ is 20 x 1280 ms, as defined in Table 8.4.2.3-1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5 E-UTRAN FDD - UTRAN measurements

8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.5.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

8.5.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell within

$$\mathrm{T}_{\mathrm{identify,\ UTRA\_FDD}} = \mathrm{T}_{\mathrm{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T}_{\mathrm{inter1}}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,

- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$\mathrm{T}_{\mathrm{measurement\_UTRA\_FDD}} = Max\left\{\mathrm{T}_{\mathrm{Measurement\_Period\ UTRA\_FDD}}, \mathrm{T}_{\mathrm{basic\_measurement\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T}_{\mathrm{inter1}}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{\text{basic measurement UTRA\_FDD}}$ = 6 (cells)

$T_{\text{Measurement\_Period UTRA\_FDD}}$ = 480 ms. The period used for calculating the measurement period.

$T_{\text{basic\_measurement\_UTRA\_FDD}}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{\text{basic measurement UTRA\_FDD}}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_FDD}}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify UTRA\_FDD}}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.5.1.

8.5.1.4 Test description

8.5.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.5.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.1.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.1.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to Cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.5.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table's 8.5.1.5-1 and 8.5.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2.. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.5.1.5-1 and 8.5.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.5.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
}			
}			
}			

Table 8.5.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD INTEGER (0..511)	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

8.5.1.5 Test requirement

Tables 8.5.1.4.1-1, 8.5.1.5-1 and 8.5.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.5.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD (Cell 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4 + TT	4 + TT
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94 + TT	-94 + TT
SCH_RP	dBm/15 kHz	-94 + TT	-94 + TT
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.5.1.5-2: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD event triggered reporting under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8 + TT
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14 + TT
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.5.2.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN FDD - UTRAN FDD cell search requirements for identification of a new UTRA FDD cell for SON given in TS36.133 [4] section 8.1.2.4.7.1. 1.

8.5.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

8.5.2.3 Minimum conformance requirements

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{\text{Tinter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify, UTRA\_FDD}$ ms, the UE may stop searching UTRA cells for SON.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.7 and A.8.5.2.

8.5.2.4 Test description

8.5.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.
2. The general test parameter settings are set up according to Table 8.5.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.5.2.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.2.4.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	>5	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	s	6	

8.5.2.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3 according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Tables 8.5.2.5-1 and 8.5.2.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

4. SS shall transmit an RRCConnectionReconfiguration message.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.5.2.5-1 and 8.5.2.5-2.

7. The UE shall transmit a MeasurementReport message containing the primary scrambling code of cell 2. If the overall delays measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

8. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.2.4.3-1: Common Exception messages for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.5.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF MeasObjectToAddMod	2 entry		
MeasObjectToAddMod ::= SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod ::= SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF ReportConfigToAddMod	1 entry		
ReportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT-SON-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of MeasIdToAddMod	1 entry		
MeasIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.5.2.4.3-3: *ReportConfigInterRAT-SON-UTRA*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-SON-UTRA::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose ENUMERATED {	reportStrongestCellsForSON		
}			
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	1		
}			

Table 8.5.2.4.3-4: *MeasResults*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.2.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA			
MeasResultUTRA ::= SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	The primary scrambling code, as defined in TS 25.331	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			
}			
}			

8.5.2.5 Test requirement

Tables 8.5.2.4.1-1, 8.5.2.5-1 and 8.5.2.5-2 define the primary level settings including test tolerances for UTRAN FDD cell search for SON ANR under AWGN propagation conditions test.

Table 8.5.2.5-1: Cell specific test parameters for E-UTRAN FDD (cell # 1) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4 + TT	4 + TT
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT
RSRP Note 4	dBm/15 kHz	-94 + TT	-94 + TT
SCH_RP	dBm/15 kHz	-94 + TT	-94 + TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.5.2.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-3.35 + TT
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-15 + TT
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}			

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 4802 ms from the beginning of time period T2.

When no DRX is used the UE shall be able to identify a new cell within:

$$\mathrm{T}_{\mathrm{identify,\ UTRA\_FDD}} = \mathrm{T}_{\mathrm{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{Tinter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms.TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

8.5.3 E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.5.3.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX under fading propagation conditions within the E-UTRA FDD - UTRA FDD cell search requirements.

8.5.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRA FDD.

8.5.3.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify, UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within Tidentify, UTRA_FDD as in table 8.5.3.3-1.

Table 8.5.3.3-1: Requirements to identify a newly detectable UTRA FDD cell

DRX cycle length (s)	$T_{identify\_UTRA\_FDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable
0.064	2.56* Nfreq (40* Nfreq)	4.8* Nfreq (75* Nfreq)
0.08	3.2* Nfreq (40* Nfreq)	4.8* Nfreq (60* Nfreq)
0.128	2.56* Nfreq (20* Nfreq)	4.8* Nfreq (37.5* Nfreq)
0.16	3.2* Nfreq (20* Nfreq)	4.8* Nfreq (30* Nfreq)
0.16<DRX-cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable when

- CPICH Ec/Io ≥ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

The UE shall be capable of performing RSCP and Ec/Io measurements of at least 6 UTRA cells per UTRA FDD carrier and the UE physical layer shall be capable of reporting RSCP and Ec/Io measurements to higher layers with the measurement period defined in table 8.5.3.3-2.

Table 8.5.3.3-2: Requirements to measure UTRA FDD cells

DRX cycle length (s)	$T_{measure\_UTRA\_FDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	**Gap period = 80 ms**
≤0.04	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable	Non DRX Requirements in TS 36.133 [4] section 8.1.2.4.1.1 are applicable
0.064	0.48* N_{freq} (7.5* N_{freq})	0.8* N_{freq} (12.5* N_{freq})
0.08	0.48* N_{freq} (6* N_{freq})	0. 8* N_{freq} (10* N_{freq})
0.128	0.64* N_{freq} (5* N_{freq})	0. 8* N_{freq} (6.25* N_{freq})
0.128<DRX-cycle≤2.56	Note (5* N_{freq})	Note (5* N_{freq})
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in TS 36.133 [4] clause 9.1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ UTRA\_FDD}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1.2 and A.8.5.3.

8.5.3.4 Test description

8.5.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.5.3.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.5.3.4.3.

5. There is one E-UTRA FDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.5.3.4.1-1: General Test Parameters for E-UTRAN FDD- UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1 Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD		As specified in section A.2.1.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on UTRA RF channel number 1.
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
UTRA RF Channel Number		1		One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io		
b1-Threshold-UTRA	dB	-18		CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.5.3.5-2
Monitored UTRA FDD cell list size		12		UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5		
T2	s	6	30	

8.5.3.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 8.5.3.5-1, 8.5.3.5-2, 8.5.3.5-3 and 8.5.3.5-5. Propagation conditions are set according to Annex B clauses B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table’s 8.5.3.5-1 and 8.5.3.5-4. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 2442 ms for Test 1 or less than 26882 ms for Test 2 then the number of

successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.3.2.4.1-1 as appropriate.

8.5.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.5.3.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.5.3.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.5.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.5.3.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7B ReportConfigInterRAT-B1(EUTRA-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 - 49)/2 dB)	
}			
}			
}			
}			
hysteresis	0(0 dB)		
}			
}			
}			

Table 8.5.3.4.3-4: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.5.3.4.3-5: *MeasResults*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.5.3.4.3-6: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	250	PhysCellIdUTRA-FDD	
}			
measResult SEQUENCE {			
utra-EcN0		Set according to specific test	
}			
}			

Table 8.5.3.4.3-7: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark
Downlink information common for all radio links - Downlink DPCH info common for all RL - Timing indicator - Default DPCH Offset Value	 Initialize Arbitrary set to value 0..306688 by step of 512

8.5.3.5 Test requirement

Tables 8.5.3.4.1-1, 8.5.3.5-1 and 8.5.3.5-4 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.5.3.5-1: Cell Specific Test requirement Parameters for Cell 1 E-UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

$\hat{E}_s/I_{ot}$	dB	4 + TT	4 + TT
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94 + TT	-94 + TT
SCH_RP	dBm/15 kHz	-94 + TT	-94 + TT
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.5.3.5-2: DRX-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.5.3.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

Table 8.5.3.5-4: Cell Specific Test requirement Parameters for Cell 2 UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8 + TT
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14 + TT
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delays measured when DRX cycle length is 40 ms in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$=

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 60 ms.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 2442 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_UTRA\_FDD}$

$T_{identify\_UTRA\_FDD}$ = 25600 ms. When DRX cycle length is 1280 ms the $T_{identify\_UTRA\_FDD}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.6 E-UTRAN TDD - UTRAN FDD measurements

8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *It has not been decided how to handle the scenario that any timing information of Cell 2 should be deleted in the UE in the test procedure*

8.6.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA FDD cell search requirements.

8.6.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA FDD.

8.6.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_FDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

Where:

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter-RAT equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurement the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.2 of with measurement period given by

$$\mathrm{T}_{\text{measurement \_UTRA\_FDD}} = Max\left\{ \mathrm{T}_{\text{Measurement\_Period UTRA\_FDD}}, \mathrm{T}_{\text{basic\_measurement\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} \cdot N_{Freq} \right\} ms$$

Where:

$X_{\text{basic measurement UTRA\_FDD}}$ = 6 (cells)

$T_{\text{Measurement\_Period UTRA\_FDD}}$ = 480 ms. The period used for calculating the measurement period.

$T_{\text{basic\_measurement\_UTRA\_FDD}}$ = 50 ms. This is the time period used in the equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{\text{basic measurement UTRA\_FDD}}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_FDD}}$.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify UTRA\_FDD}}$ defined in TS 36.133 [4] clause 8.1.2.4.1.1.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.2 and A.8.6.1.

8.6.1.4 Test description

8.6.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.

2. The general test parameter settings are set up according to Table 8.6.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.6.1.4.3.

5. There is one E-UTRA TDD serving cell and one UTRA FDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.6.1.4.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/Io threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
T1	s	5	
T2	s	6	

8.6.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table's 8.6.1.5-1 and 8.6.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2.. T1 starts.

3. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

4. SS shall transmit an RRCConnectionReconfiguration message.

5. The UE shall transmit RRCConnectionReconfigurationComplete message.

6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.6.1.5-1 and 8.6.1.5-2.

7. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 4802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

8. After the SS receive the MeasurementReport message in step 4) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

8.6.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.6.1.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.6.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
tutra-EcN0	13 (-18dB)	The actual value is (IE value - 49)/2 dB	
}			
}			
}			
}	0 (0dB)		
hysteresis			
}			
}			

Table 8.6.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServiCCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.6.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	UTRA-FDD-CellIdentity		
}			
measResult SEQUENCE {			
cpich-EcN0		Set according to specific test	
}			
}			

8.6.1.5 Test requirement

Tables 8.6.1.4.1-1, 8.6.1.5-1 and 8.6.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.6.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

$\hat{E}_s / I_{ot}$	dB	4	4
$\hat{E}_s / N_{oc}$	dB	4	4
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.6.1.5-2: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or} / I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7 E-UTRAN TDD - UTRAN measurements

8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *It only includes 1.28 Mcps TDD option related requirements*

8.7.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA TDD - UTRA TDD cell search requirements.

8.7.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

8.7.1.3 Minimum conformance requirements

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_TDD.}$

$X_{basic\ measurementUTRA\_TDD} = 6$

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.7.1.

8.7.1.4 Test description

8.7.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.7.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.7.1.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7.1.4.1-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells 3ms or 92160*Ts
Ofn	dB	0	
Hys	dB	0	
Thresh	dBm	-87	
T1	s	5	
T2	s	10	

8.7.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table's 8.7.1.5-1 and 8.7.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7.1.5-1 and 8.7.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6402 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall change to set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.1.4.3-1: Common Exception messages for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.7.1.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f9		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f9)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f9		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.7.1.4.3-3: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	28	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	UTRA-TDD
}			
}			
}			
}			
hysteresis	0 (0dB)	The actual value is IE value * 0.5 dB.	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.1.4.3-4: *MeasResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.7.1.5 Test requirement

Tables 8.7.1.4.1-1, 8.7.1.5-1 and 8.7.1.5-2 define the primary level settings including test tolerances for E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table 8.7.1.5-1: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1)

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Cell 1</th></tr>
<tr><th>T1</th><th>T2</th></tr>
<tr><td>E-UTRA RF Channel Number</td><td></td><td colspan="2">1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="2">10</td></tr>
<tr><td>OCNG Pattern defined in D.2.1 (OP.1 TDD)</td><td></td><td colspan="2">OP.1 TDD</td></tr>
<tr><td>PBCH_RA</td><td>dB</td><td rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td>PBCH_RB</td><td>dB</td></tr>
<tr><td>PSS_RB</td><td>dB</td></tr>
<tr><td>SSS_RB</td><td>dB</td></tr>
<tr><td>PCFICH_PA</td><td>dB</td></tr>
<tr><td>PHICH_PA</td><td>dB</td></tr>
<tr><td>PHICH_PB</td><td>dB</td></tr>
<tr><td>PDCCH_PA</td><td>dB</td></tr>
<tr><td>PDCCH_PB</td><td>dB</td></tr>
<tr><td>PDSCH_PA</td><td>dB</td></tr>
<tr><td>PDSCH_PB</td><td>dB</td></tr>
<tr><td>OCNG_RA[Note1]</td><td>dB</td></tr>
<tr><td>OCNG_RB[Note1]</td><td>dB</td></tr>
<tr><td>$\hat{E}_s/I_{ot}$</td><td>dB</td><td>9+TT</td><td>9+TT</td></tr>
<tr><td>N_{oc}</td><td>dBm/15kHz</td><td colspan="2">-98</td></tr>
<tr><td>RSRP</td><td>dBm/15kHz</td><td>-89+TT</td><td>-89+TT</td></tr>
<tr><td>SCH_RP</td><td>dBm/15kHz</td><td>-89+TT</td><td>-89+TT</td></tr>
<tr><td>Propagation Condition</td><td></td><td colspan="2">ETU70</td></tr>
<tr><td colspan="4">Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.</td></tr>
</table>

Table 8.7.1.5-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3+TT	-3+TT		
DwPCH_Ec/Ior	dB			0+TT	0+TT
OCNS_Ec/Ior NOTE2	dB	-3+TT	-3+TT		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5+TT	-inf	5+TT
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78 +TT	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one [Event B1] triggered measurement report to Cell 2.

The overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 60 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of [6402 ms] in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *It only includes 1.28 Mcps TDD option related requirements*

8.7.2.1 Test purpose

The test cases are to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify E-UTRA TDD to UTRA TDD cell search requirements when DRX is used in TS 36.133 [4] section 8.1.2.4.3.2.

8.7.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

8.7.2.3 Minimum conformance requirements

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify\_UTRA\_TDD}$ as shown in table 8.7.2.3-1

Table 8.7.2.3-1: Requirement to identify a newly detectable UTRA TDD cell

DRX cycle length (s)	$T_{identify\_UTRA\_TDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.32	Non DRX Requirements in TS 36.133[4] section 8.1.2.4.3.1 are applicable	Non DRX Requirements in TS 36.133[4] section 8.1.2.4.3.1 are applicable
0.64≤DRX-cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)
Note: Time depends upon the DRX cycle in use		

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

- P-CCPCH Ec/Io ≥ -8 dB,
- DwPCH_Ec/Io ≥ -5 dB.

When L3 filtering is used an additional delay can be expected.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements of at least 6 UTRA cells per UTRA TDD carrier and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period defined in table 8.7.2.3-2.

Table 8.7.2.3-2: Requirement to measure UTRA TDD cells

DRX cycle length (s)	$T_{measure\_UTRA\_TDD}$ (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in TS 36.133[4] section 8.1.2.4.3.1 are applicable	Non DRX Requirements in TS 36.133[4] section 8.1.2.4.3.1 are applicable
0.064	$0.48*N_{freq}$ ($7.5*N_{freq}$)	$0.8*N_{freq}$ ($12.5*N_{freq}$)
0.08	$0.48*N_{freq}$ ($6*N_{freq}$)	0. $8*N_{freq}$ ($10*N_{freq}$)
0.128	$0.64*N_{freq}$ ($5*N_{freq}$)	0. $8*N_{freq}$ ($6.25*N_{freq}$)
0. 128<DRX-cycle≤2.56	Note ($5*N_{freq}$)	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in the TS 36.133[4] sub-clause 9.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.2 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements TS 36.133 [4] in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.2.2 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.2 and A.8.7.2.

8.7.2.4 Test description

8.7.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.7.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.7.2.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test. Cell 2 (UTRAN TDD cell) is to be searched. Gap pattern configuration # 0 as defined in TS 36.133 [4] table 8.1.2.1-1 is provided.

Table 8.7.2.4.1-1: General test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Active cell		Cell 1		E-UTRAN TDD cell
Neighbour cell		Cell 2		UTRAN 1.28Mcps TDD cell
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
PRACH configuration		53		As specified in table 5.7.1-3 in 3GPP TS 36.211
CP length of cell 1		Normal		
Ofn	dB	0		
Hys	dB	0		
Thresh	dBm	-83		Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.7.2.5-3
Time offset between cells	ms	3		Asynchronous cells 3ms or 92160*Ts
T1	s	5		
T2	s	8	30	

8.7.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignmnent timer to keep UE uplink time alignmnend. Furhtermore UE is allocated wit hPUSCH resource at every DRX cycle. In Test 2 the uplink time aligment is not maintained and UnE needs to use RACH to obtain UL allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table's 8.7.2.5-1 and 8.7.2.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
3. The SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.7.2.5-1 and 8.7.2.5-2. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 6442 ms for Test1 or less than 26882 ms for Test2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. SS shall set Cell 2 cell parameter id = (current Cell 2 cell parameter id+4) mod 16 for next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.7.2.4.1-1 as appropriate.

8.7.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.2.4.3-1: Common Exception messages for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.7.2.4.3-2: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.7.2.4.3-3: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.7.2.4.3-4: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
thresholdUTRA-RSCP	32	UTRA-Thres + 115 UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
hysteresis	0	The actual value is IE value * 0.5 dB INTEGER (0..30)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.7.2.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.7.2.4.3-6: *MeasResults*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.2.4.3-7: *MeasResultListUTRA*: Additional E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	12	PhysCellIdUTRA-TDD INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test INTEGER (-5..91)	
}			
}			

Table 8.7.2.4.3-8: HANDOVER TO UTRAN COMMAND

Information Element	Value/remark
Downlink information common for all radio links - Downlink DPCH info common for all RL - Timing indicator - Default DPCH Offset Value	 Initialize 0 Integer (0..7)

8.7.2.5 Test requirement

The common test parameters are given in Tables 8.7.2.4.1-1, 8.7.2.5-1 and 8.7.2.5-2. DRX configuration for Test1 and Test2 are given in Table 8.7.2.5-3 and time alignment timer and scheduling request related parameters in Table 8.7.2.5-4.

Table 8.7.2.5-1: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions (cell 1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	0
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB		
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
$OCNG\_RA^{Note1}$	dB		
$OCNG\_RB^{Note1}$	dB		

$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
N_{oc} Note 2	dBm/15kHz	-98	
RSRP Note 3	dBm/15kHz	-94+TT	-94+TT
SCH_RP Note 3	dBm/15kHz	-94+TT	-94+TT
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.7.2.5-2: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/Ior	dB	-3+TT	3+TT		
DwPCH_Ec/Ior	dB			0+TT	0+TT
OCNS_Ec/Ior NOTE2	dB	-3+TT	3+TT		
$\hat{I}_{or}/I_{oc}$	dB	-inf	9+TT	-inf	9+TT
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-74 +TT	n.a.	n.a.
Propagation Condition		Case 3 NOTE3			
Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to Ior. Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

Table 8.7.2.5-3: drx-Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table 8.7.2.5-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE send one Event B1 triggered the measurement report on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delay measured may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$=

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms. It is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 60 ms.

N_{freq} = 1. It is defined in TS 36.133 [4] clause 8.1.2.1.1.

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 6442 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = measurement reporting delay + TTI insertion uncertainty + DRX cycle length

Measurement reporting delay = $T_{identify\_UTRA\_TDD}$

$T_{identify\_UTRA\_TDD}$ = 25600 ms. When DRX cycle length is 1280 ms the $T_{identify\_UTRA\_TDD}$ is 20 x 1280 ms.

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 26882 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.7.3.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN TDD cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN TDD - UTRAN TDD cell search requirements for identification of a new UTRA TDD cell for SON given in section TS 36.133[4] 8.1.2.4.7.13.1.

8.7.3.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

8.7.3.3 Minimum conformance requirements

When no DRX is used the UE shall be able to identify a new cell within:

$$\mathrm{T}_{\mathrm{identify,\ UTRA\_TDD}} = \mathrm{T}_{\mathrm{basic\_identify\_UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\mathrm{inter1}}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA TDD cell for SON within 8*$T_{identify,\ UTRA\_TDD}$ ms, the UE may stop searching UTRA TDD cells for SON.

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in section 8.1.2.4.13.1.1 in TS36.133 and in section 8.1.2.4.13.1.2 in TS36.133 for non DRX and DRX cases respectively. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.13 and A.8.7.3.

8.7.3.4 Test description

8.7.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.18.
2. The general test parameter settings are set up according to Table 8.7.3.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.7.3.4.3.
5. There is one E-UTRA TDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.7.3.4.1-1: General test parameters for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	s	>5	During T1, cell 2 shall be powered off, and during the off time the scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	s	6	

8.7.3.4.2 Test procedure

The test consists of one active E-UTRAN cell and one neighbour UTRAN cell. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Tables 8.7.3.5-1 and 8.7.3.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. The SS shall set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.
4. SS shall transmit an RRCConnectionReconfiguration message.
5. The UE shall transmit RRCConnectionReconfigurationComplete message.
6. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 8.7.3.5-1 and 8.7.3.5-2.
7. The UE shall transmit a MeasurementReport message containing the primary scrambling code of cell 2. If the overall delays measured from the beginning of time period T2 is less than 12802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
8. After the SS receive the MeasurementReport message in step 7) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.7.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.7.3.4.3-1: Common Exception messages for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.7.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f9		
measObject CHOICE {			
MeasObjectUTRA	MeasObjectUTRA-GENERIC(f9)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
MeasObjectToAddMod SEQUENCE {			
reportConfigId	idReportConfig		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT-SON-UTRA		
}			
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f9		
reportConfigId	idReportConfig		
}			
quantityConfig	QuantityConfig-DEFAULT		UTRAN
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.7.3.4.3-3: *ReportConfigInterRAT-SON-UTRA*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-SON-UTRA::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose ENUMERATED {	reportStrongestCellForSON		
}			
}			
}			
maxReportCells	1		
reportInterval	ms1024		
reportAmount	r1		
}			

Table 8.7.3.4.3-4: *MeasResults*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.7.3.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultUTRA			
MeasResultUTRA ::= SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	The primary scrambling code, as defined in TS 25.331	
}			
measResult SEQUENCE {			
utra-RSCP		Set according to specific test	
}			
}			

8.7.3.5 Test requirement

Tables 8.7.3.4.1-1, 8.7.3.5-1 and 8.7.3.5-2 define the primary level settings including test tolerances for UTRAN TDD cell search for SON ANR under AWGN propagation conditions test.

Table 8.7.3.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1	
		T1	**T2**
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT
RSRP Note 4	dBm/15 kHz	-94+TT	-94+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.7.3.5-2: Cell specific test parameters for UTRAN TDD (cell # 2) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1		T2	
UTRA RF Channel number Note2		Channel 2			
DL timeslot number		0	DwPTS	0	DwPTS
PCCPCH_Ec/Ior	dB	-3		-3	
DwPCH_Ec/Ior	dB		0		0
OCNS_Ec/Ior	dB	-3		-3	
Îor/Ioc	dB	-Infinity		5+TT	
PCCPCH RSCP Note1	dBm	-Infinity	n.a.	-73	n.a.
Io Note1	dBm/1.28MHz	-Infinity		-70.88	
Ioc	dBm/1.28MHz	-75			
Propagation condition		AWGN			
Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.					

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

When no DRX is used the UE shall be able to identify a new cell within:

$$\mathrm{T}_{\mathrm{identify,\ UTRA\_TDD}} = \mathrm{T}_{\mathrm{basic\_identify\_UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\mathrm{inter1}}} \cdot N_{Freq} \quad ms$$

$\mathrm{T}_{\mathrm{basic\_identify\_UTRA\_TDD}}$ = 800 ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$\mathrm{T}_{\mathrm{Inter1}}$ = 30 ms.TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

8.8 E-UTRAN FDD - GSM measurements

8.8.1 E-UTRAN FDD - GSM event triggered reporting in AWGN

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.8.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event when doing inter-RAT (GSM) measurements under AWGN condition within the E-UTRA FDD - GSM cell search requirements.

8.8.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM.

8.8.1.3 Minimum conformance requirements

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as $N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{carriers,\ GSM}$ /20) where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every 8*$T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re-confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5 and A.8.8.1

8.8.1.4 Test description

8.8.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.

2. The general test parameter settings are set up according to Table 8.8.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.8.1.4.3.

5. There is one E-UTRA FDD carrier and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.8.1.4.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	5	

8.8.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.8.1.5-1. Propagation conditions are set according to Annex B clause B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.8.1.5-1 and 8.8.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the measurement reporting delay measured from the beginning of time period T2 is less than 3122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

8.8.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.8.1.4.3-1: Common Exception messages for E-UTRAN FDD - GSM Event triggered reporting in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-6 Table H.3.1-7

Table 8.8.1.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.8.1.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0 dB)		
}			
}			
}			

Table 8.8.1.4.3-4: *MeasResults*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.6.1.4.3-5: *MeasResultListGERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

8.8.1.5 Test requirement

Tables 8.8.1.4.1-1, 8.8.1.5-1 and 8.8.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-GSM event triggered reporting under AWGN conditions.

Table 8.8.1.5-1: Cell specific test parameters for E-UTRAN FDD (Cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
$\hat{E}_s/N_{oc}$		4+TT	4+TT
N_{oc}	dBm/15 kHz	-98	
RSRP	dBm/15 kHz	-94+TT	-94+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table 8.8.1.5-2: Cell specific test parameters for GSM (Cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75+TT
GSM BSIC		N/A	Valid

The overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE sends one Event B1 triggered measurement report including BSIC of Cell 2.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured shall be less than a total of 3122 ms in this test case. (The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay plus the TTI insertion uncertainty of 2ms).

The event triggered measurement reporting delay = $2*T_{\text{Measurement Period, GSM}}$ = 2* 480 ms = 960 ms.

Initial BSIC identification delay = 2160 ms.

TTI insertion uncertainty = 2 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.8.2 E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.8.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event in DRX when doing inter-RAT (GSM) measurements under AWGN condition within the E-UTRA FDD - GSM cell search requirements.

8.8.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support GSM.

8.8.2.3 Minimum conformance requirements

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4]. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{\text{GSM carrier RSSI}}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{\text{Measurement Period, GSM}}$, for the GSM carrier RSSI measurement is shown in Table 8.1.2.4.5.2.1-1 in TS 36.133 [4]. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as $N_{freq} = N_{\text{freq, E-UTRA}} + N_{\text{freq, UTRA}} + M_{gsm}$

Where:

$N_{\text{freq, E-UTRA}}$ is the number of E-UTRA carriers being monitored

$N_{\text{freq, UTRA}}$ is the number of UTRA carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil ($N_{\text{carriers, GSM}}$ /20) where $N_{\text{carriers, GSM}}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells.
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.2.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be made on GSM cells that are required with BSIC verified.

For DRX cycle length ≤ 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.1 in TS 36.133 [4] shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every N_{freq}*30s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within N_{freq}*60 s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in section 8.1.2.1.1 in TS 36.133 [4].

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length ≤ 40 ms, GSM BSIC re-confirmation requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.2 in TS 36.133 [4] shall apply.

For DRX cycle length > 40 ms, at least every N_{freq}*30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell. If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within N_{freq}*60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.4.5.2.2.1 in TS 36.133 [4]. The parameter N_{freq} is defined in section 8.1.2.1.1 in TS 36.133 [4].

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{\text{Measurement Period, GSM}}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC, measured without L3 filtering shall be less than $2*T_{\text{Measurement Period, GSM}}$, where $T_{\text{Measurement Period, GSM}}$ is defined in section 8.1.2.4.5.1 of TS 36.133 [4]. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.2 and A.8.8.2.

8.8.2.4 Test description

8.8.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The general test parameter settings are set up according to Table 8.8.2.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.8.2.4.3.
5. There is one E-UTRA FDD carrier and one GSM cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.8.2.4.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD		As specified in section A.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD		As specified in section A.1.2.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 [4] section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI		
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211 [9]
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.8.2.5-2
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1		List of GSM cells provided before T2 starts.
T1	s	5		
T2	s	5	45	

8.8.2.4.2 Test procedure

The test consists of one active cell and one neighbour cell. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

In Test 1 when DRX = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 1280 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table 8.8.2.5-1, 8.8.2.5-2, 8.8.2.5-3 and 8.8.2.5-4. propagation conditions are set according to Annex B clause B.1.1.T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.8.2.5-1 and 8.8.1.5-4. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delays measured from the beginning of time period T2 is less than 3162 ms for Test 1 or less than 44082 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. The SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

11. Repeat step 1-10 for each sub-test in Table 8.8.2.4.1-1 as appropriate.

8.8.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.8.2.4.3-1: Common Exception messages for E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-6 Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.8.2.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.8.2.4.3-3: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.8.2.4.3-4: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
B1-ThresholdGERAN CHOICE {			
thresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0 dB)		
}			
}			
}			

Table 8.8.2.4.3-5: *SchedulingRequest-Config-DEFAULT*: Additional E-UTRAN FDD-GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20 SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	10 MHz channel bandwidth parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.8.2.4.3-6: *MeasResults*: Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.8.2.4.3-7: *MeasResultListGERAN:* Additional E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
MeasResultGERAN SEQUENCE {			
carrierFreq	CarrierFreqGERAN	Contains the carrier frequency of the target GERAN cell	
physCellId	PhysCellIdGERAN	Contains the Base Station Identity Code (BSIC)	
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

8.8.2.5 Test requirement

Tables 8.8.2.4.1-1, 8.8.2.5-1 and 8.8.2.5-4 define the primary level settings including test tolerances for E-UTRAN FDD-GSM event triggered reporting when DRX is used under AWGN conditions.

Table 8.8.2.5-1: Cell specific test parameters for E-UTRAN FDD (Cell # 1) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4 + TT	4 + TT
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94 + TT	-94 + TT
SCH_RP	dBm/15 kHz	-94 + TT	-94 + TT
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.8.2.5-2: DRX-Configuration to be used in E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	sf1	sf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331 [5].			

Table 8.8.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex*-Configuration to be used in E-UTRAN FDD-GSM Event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331 [5].
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213 [8].

Table 8.8.2.5-4: Cell specific test parameters for GSM (Cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75+TT
GSM BSIC		N/A	Valid

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH.

In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = 2*$T_{Measurement\ Period,\ GSM}$ + $T_{identify,\ GSM}$ + TTI insertion uncertainty + DRX cycle length

$T_{Measurement\ Period,\ GSM}$ = 480 ms (as specified in table 8.1.2.4.5.2.1-1 of TS36.133 [4] clause 8.1.2.4.5.2.1)

$T_{identify,\ GSM}$ = 2160 ms (as specified in table 8.1.2.4.5.1.2.1-1 of TS36.133 [4] clause 8.1.2.4.5.1.2.1)

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3162 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = 2*$T_{Measurement\ Period,\ GSM}$ + N_{freq} * 30s + TTI insertion uncertainty + DRX cycle length

$T_{Measurement\ Period,\ GSM}$ = 6400 ms (as specified in table 8.1.2.4.5.2.1-1 of TS36.133 [4] clause 8.1.2.4.5.2.1)

N_{freq} = 1 (as specified in TS36.133 clause 8.1.2.1.1)

N_{freq} * 30 s = 30000 ms (as specified in TS36.133 [4] clause 8.1.2.4.5.2.2.2 for when DRX cycle length > 40 ms)

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 44082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.9 E-UTRAN FDD - UTRAN TDD measurements

8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.9.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event under fading propagation conditions within the E-UTRA FDD - UTRA TDD cell search requirements.

8.9.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward that support UTRAN TDD..

8.9.1.3 Minimum requirement

The measurement reporting delay shall be less than $T_{\text{identify, UTRA\_TDD}}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{\text{identify, UTRA\_TDD}} = Max\left\{5000, T_{\text{basic identify UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

where

$T_{\text{basic\_identify\_UTRA\_TDD}}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

T_{Inter1} = 30 ms. This is the minimum available time for inter-RAT measurement during 480 ms period

N_{Freq}: This is the number of UTRA carriers being monitored

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Section 9.3 with measurement period given by

$$T_{\text{measurement UTRA\_TDD}} = Max\left\{T_{\text{Measurement\_Period UTRA\_TDD}}, T_{\text{basic measurement UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{\text{Measurement\_Period UTRA\_TDD}}$ = 480 ms is the period used for calculating the measurement period $T_{\text{measurement\_UTRA\_TDD}}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in section 8.1.2.1.1

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_TDD.}$ Where $X_{basic\ measurementUTRA\_TDD}$= 6.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3 and A.8.9.

8.9.1.4 Test description

8.9.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.15.
2. The general test parameter settings are set up according to Table 8.9.1.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.9.1.4.3.
5. There is one E-UTRA FDD serving cell and one UTRA TDD cell specified in the test. Cell 1 (E-UTRA FDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.9.1.4.1-1: General test parameters for Event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Active cell		Cell 1	E-UTRA FDD Cell 1
Neighbour cell		Cell 2	UTRA TDD Cell 2 is to be identified.
Gap Pattern Id		1	As specified in TS 36.133 section8.1.2.1. Measurement Gap Repetition Period = 80ms
Inter-RAT measurement quantity		UTRA TDD PCCPCH RSCP	
Threshold other system	dBm	-71	UTRA TDD PCCPCH RSCP threshold for event B1.
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
T1	s	5	
T2	s	15	

8.9.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table's 8.9.1.5-1 and 8.9.1.5-2. Propagation conditions are set according to Annex B clause B.1.1 and B.2.2. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.9.1.5-1 and 8.9.1.5-2.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 12880 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 4) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall change set cell 2 cell parameter id =(current cell 2 cell parameter id +4) mod 16.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Tables G.2.6-1 in Annex G clause G.2 is achieved.

8.9.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.9.1.4.3-1: Common Exception messages for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-4 Table H.3.1-7

Table 8.9.1.4.3-2: *ReportConfigInterRAT-B1-UTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdUTRA CHOICE {			
utra-RSCP	44	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	
}			
}			
}			
}			
hysteresis	0		
}			
}			
}			

Table 8.9.1.4.3-3: *MeasuredResults*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCellsCHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.9.1.4.3-4: *MeasResultListUTRA*: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellIdphysicallCellIdentity CHOICE {			
tdd	UTRA-TDD-CellIdentity		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test		
}			
}			

Table 8.9.1.4.3-5: CellGlobalId-UTRA: Additional E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CellGlobalIdUTRA ::= SEQUENCE {			
plmn-Identity	PLMN-Identity		
cellIdentity		BIT STRING (SIZE (28))	
}			

8.9.1.5 Test requirement

Tables 8.9.1.4.1-1, 8.9.1.5-1 and 8.9.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions in synchronous cells test.

Table A.8.9.1.5-1: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell1)

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 1]	dB		
OCNG_RB[Note 1]	dB		

N_{oc}	dBm/15KHz	-98	
RSRP	dBm	-94+TT	-94+TT
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
P-SCH_RP	dBm	-94+TT	
S-SCH_RP	dBm	-94+TT	
Propagation Condition		ETU70	
Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

Table A.8.9.1.5-2: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell2)

Parameter	Unit	Cell 2			
		T1		T2	
Timeslot Number		0	DwPTS	0	DwPTS
UTRA RF Channel Number (NOTE1)		Channel1			
PCCPCH_Ec/Ior	dB	-Infinity		-3+TT	
DwPCH_Ec/Ior	dB	-Infinity			0+TT
OCNS_Ec/Ior		-Infinity		-3+TT	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity		9+TT	
I_{oc}	dBm/1.28 MHz	-70			
PCCPCH_RSCP	dB	-Infinity		-64+TT	
PropagationCondition		Case 3 (NOTE2)			
NOTE 1: The DPCH of the cell is located in a timeslot other than 0. NOTE 2: Case 3 propagation conditions are specified in TS 25.102 Annex B.					

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms \backslash$$

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 12802 ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.10 E-UTRAN TDD - GSM measurements

8.10.1 E-UTRAN TDD - GSM event triggered reporting in AWGN

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.10.1.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements. This test will partly verify the E-UTRAN TDD - GSM cell search requirements in TS 36.133[4] section 8.1.2.4.6.

8.10.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM.

8.10.1.3 Minimum conformance requirements

The requirements in this section apply only to UE supporting E-UTRAN TDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to TS 36.133[4] Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in TS 36.133[4] section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq}*480 ms. The parameter N_{freq} is defined in TS 36.133[4] section 8.1.2.1.1.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, when at least 25% of the measurement gaps available for GSM monitoring purposes are used for GSM RSSI purposes the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in TS 36.133[4] section 8.1.2.4.5.1.2.1.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in TS 36.133[4] section 8.1.2.4.5.1.2.2.

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to TS 36.133[4] section 8.1.2.4.5.1 when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8 * T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.10.1.3-1.

Table 8.10.1.3-1: The gap length and maximum time difference for BSIC verification

Gap length [ms]	Maximum time difference [µs]
6	± 2350 µs

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in TS 36.133[4] section 8.1.2.4.5.1.2

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.10.1.3-2. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Table 8.10.1.3-2

Number of carriers other than GSM	$T_{identify,gsm}$(ms)		$T_{reconfirm,gsm}$(ms)	
	40ms gap configuration (ID 0)	80ms gap configuration (ID 1)	40ms gap configuration (ID 0)	80ms gap configuration (ID 1)
0	2160	5280	1920	5040
1	5280	21760	5040	17280
2	5280	31680	5040	29280
3	19440	No requirement	13320	No requirement
4	31680	No requirement	29280	No requirement
5	31680	No requirement	29280	No requirement

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For each measurement gap used for GSM BSIC reconfirmation as described in TS 36.133[4] section 8.1.2.4.5.1.2, the UE shall attempt to decode the BSIC falling within the measurement gap according to table 8.10. 1.3 - 2. If more than one BSIC can be decoded within the same measurement gap, priority shall be given to the least recently decoded BSIC.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $T_{re-confirm,GSM}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see TS 36.133[4] section 8.1.2.4.5.1.2.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in section TS 36.331[5].

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331[5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see TS 36.133[4] section 8.1.2.4.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in TS 36.133[4] section 8.1.2.4.5.1. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133[4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133[4] section 8.1.2.4.5.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.1 and A8.10.1

8.10.1.4 Test description

8.10.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UEs that support receive diversity.

2. The general test parameter settings are set up according to Table 8.10.1.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.10.1.4.3.

5. There is one E-UTRA TDD serving cell and one GSM cell specified in the test. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.10.1.4.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting in AWGN

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133[4] section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	5	

8.10.1.4.2 Test procedure

The test consists of one active cell and one neighbour cell. The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table's 8.10.1.5-1 and 8.10.1.5-2. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.10.1.5-1 and 8.10.1.5-2.

6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 3122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for the next iteration of the test procedure loop.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

8.10.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.10.1.4.3-1: Common Exception messages for E-UTRAN TDD-GSM event triggered reporting under fading propagation conditions

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.10.1.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD - GSM event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.10.1.4.3-3: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD - GSM event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f13		
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f13)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f13		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.10.1.4.3-4: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7A ReportConfigInterRAT-B1-GERAN(GERAN-Thres)			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventIdeventide CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdGERAN	30 (-80 dBm)	-80 is actual value in dBm (30 - 110 dBm)	
}			
}			
}			
hysteresis	0 (0dB)		
}			
}			

Table 8.10.1.4.3-5: *MeasResults*: Additional E-UTRAN TDD - GSM event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.10.1.4.3-6: *MeasResultListGERAN*: Additional E-UTRAN TDD - GSM event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId SEQUENCE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.10.1.4.3-7: *CarrierFreqGERAN*: Additional E-UTRAN TDD - GSM event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqGERAN ::= SEQUENCE {			
arfcn		INTEGER (0..1023)	
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
}			

8.10.1.5 Test requirement

The test parameters are given in Tables 8.10.1.4.1-1, 8.10.1.5-1 and 8.10.1.5-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table 8.10.1.5-1: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Pattern defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
N_{oc} Note 3	dBm/15 kHz	-98	
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT
RSRP Note 4	dBm/15 kHz	-94+TT	-94+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.10.1.5-2: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75+TT
GSM BSIC		N/A	Valid

The UE shall send one Event B1 triggered measurement report including the valid BSIC of cell # 2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE 1: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{\text{Measurement Period, GSM}}$ = 2* 480ms =960ms.

Initial BSIC identification delay = 2160 ms.

The overall delays measured shall be less than a total of 3122 ms in this test case (note: this gives 960 ms for measurement reporting delay plus 2160 for BSIC identification and plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.10.2.1 Test purpose

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD-GSM cell search requirements when DRX is used in TS 36.133[4] section 8.1.2.4.6.

8.10.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support GSM.

8.10.2.3 Minimum conformance requirements

The requirements in this section apply only to UE supporting E-UTRAN TDD and GSM.

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to TS 36.133[4] Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in TS 36.133[4] section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is shown in table 8.10.2.3-1. The parameter N_{freq} is defined in TS 36.133[4] section 8.1.2.1.1.

Table 8.10.2.3-1: GSM measurement period for large DRX

DRX cycle length (s)	$T_{measure,GSM}$ (s) (DRX cycles)
≤0.04	Non DRX Requirements are applicable
0.04<DRX-cycle≤ 0.08	Note ($6*N_{freq}$)
0.08<DRX-cycle≤ 2.56	Note ($5*N_{freq}$)
Note: Time depends upon the DRX cycle in use	

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells.

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to TS 36.133[4] section 8.1.2.4.5.2.1 when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in TS 36.331 [5].

- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.

- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.

- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.

- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every 30 seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be made on GSM cells that are requested with BSIC verified.

For DRX cycle length ≤ 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section TS 36.133 [4] 8.1.2.4.5.1.2.1 shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every N_{freq}*30s to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within N_{freq}*60 s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length ≤ 40 ms, the GSM BSIC re-conformation requirements corresponding to the non DRX requirements as specified in TS 36.133 [4] section 8.1.2.4.5.1.2.2 shall apply.

For DRX cycle length > 40 ms, at least every N_{freq}*30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell.

If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within N_{freq}*60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see TS 36.133 [4] section 8.1.2.4.5.2.2.1. The parameter N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 36.331[5].

Reported measurements in event triggered measurement reports shall meet the requirements in section 36.331[5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see TS 36.133 [4] section 8.1.2.4.5.2.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than 2*$T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in TS 36.133 [4] section 8.1.2.4.5.2.1. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133[4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133[4] section 8.1.2.4.5.2.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5.2 and A8.10.2

8.10.2.4 Test description

8.10.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and faders and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14 for UEs that support receive diversity.

2. The general test parameter settings are set up according to Table 8.10.2.4.1-1.

3. Propagation conditions are set according to Annex B clauses B.0.

4. Message contents are defined in clause 8.10.2.4.3.

5. In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in TS 36.133 [4] Table 8.1.2.1-1 is provided. Cell 1 (E-UTRA TDD cell) is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

Table 8.10.2.4.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD		As specified in section A.1.2. Note that UE may only be allocated at *On Duration*
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD		As specified in section A.2.2.
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1		Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2		Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal		Applicable to cell 1
E-UTRA RF Channel Number		1		One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10		
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI		
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	s	0		
Filter coefficient		0		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table 8.10.2.5-2
Monitored GSM cell list size		6 GSM neighbours including ARFCN 1		List of GSM cells provided before T2 starts.
T1	s	5		
T2	s	5	45	

8.10.2.4.2 Test procedure

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to T1 in Table's 8.10.2.5-1 and 8.10.2.5-4. Propagation conditions are set according to Annex B clauses B.1.1. T1 starts.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table's 8.10.2.5-1 and 8.10.2.5-4. T2 starts.
6. UE shall transmit a MeasurementReport message triggered by Event B1. If the overall delay measured from the beginning of time period T2 is less than 3162 ms for Test1 or less than 44082 ms for Test2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. SS shall set a different BSIC on Cell 2, as the previous timing information of Cell 2 is invalid in the UE for next iteration of the test procedure loop.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
11. Repeat step 1-10 for each sub-test in Table 8.10.2.4.1-1 as appropriate.

8.10.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.10.2.4.3-1: Common Exception messages for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7 Table H.3.7-1 Table H.3.7-2 Table H.3.7-3

Table 8.10.2.4.3-2: *SystemInformationBlockType7*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType7			
Information Element	**Value/remark**	**Comment**	**Condition**
commonInfo SEQUENCE {			
p-MaxGERAN	33 (33 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	30 (30 dBm)		DCS 1800 & PCS 1900
}			

Table 8.10.2.4.3-3: *PRACH-ConfigSIB-DEFAULT*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.508 clause 4.6.3 Table 4.6.3-7a PRACH-ConfigSIB-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigSIB-DEFAULT ::= SEQUENCE {			
prach-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		TDD
}			
}			

Table 8.10.2.4.3-4: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD - GSM Event triggered reporting in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig	MeasConfig -DEFAULT		
radioResourceConfigDedicated	RadioResourceConfigDedicated-HO		
}			
}			
}			
}			

Table 8.10.2.4.3-5: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f13		
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f13)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f13		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		GERAN
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.10.2.4.3-6: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B1-GERAN(GERAN-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-Threshold CHOICE {			
b1-ThresholdGERAN	30	GERAN-Thres is actual value in dBm	
}			
}			
}			
hysteresis	0	The actual value is IE value * 0.5 dB INTEGER(0..30)	
timeToTrigger	ms0		
}			
}			
}			

Table 8.10.2.4.3-7: SchedulingRequest-Config-DEFAULT: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-20: SchedulingRequest-Config-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
SchedulingRequest-Config-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
sr-PUCCH-ResourceIndex	41	Channel-bandwidth-dependent parameter	
sr-ConfigIndex	0		
dsr-TransMax	n4		
}			
}			

Table 8.10.2.4.3-8: *MeasResults*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListGERAN	MeasResultListGERAN		
}			
}			

Table 8.10.2.4.3-9: *MeasResultListGERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId SEQUENCE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
}			
}			

Table 8.10.2.4.3-10: *CarrierFreqGERAN*: Additional E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Derivation Path: 36.331 clause 6.3.4			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqGERAN ::= SEQUENCE {			
arfcn		INTEGER (0..1023)	
bandIndicator		ENUMERATED {dcs1800, pcs1900}	
}			

8.10.2.5 Test requirement

Cell specific test parameters are given in Table 8.10.2.5-1 for E-UTRAN and in Table A.8.10.2.5-4 for GSM. DRX configuration for Test1 and Test2 are given in Table 8.10.2.5-2 and time alignment timer and scheduling request related parameters in Table 8.10.2.5-3.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table 8.10.2.5-1: Cell specific test parameters for E-UTRAN TDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT
N_{oc} Note 2	dBm/15 kHz	-98	
RSRP Note 3	dBm/15 kHz	-94+TT	-94+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT
Propagation Condition		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 8.10.2.5-2: drx-Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	
Note: For further information see section 6.3.2 in 3GPP TS 36.331.			

Table 8.10.2.5-3: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

Table 8.10.2.5-4: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFNC 1	
RXLEV	dBm	-Infinity	-75+TT
GSM BSIC		N/A	Valid

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event B1 triggered measurement report to Cell 2 on PUSCH. In Test 2 when DRX cycle length = 1280 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to Cell 2 on PUSCH.

For both tests:

The overall delay may be up to 2xTTI_{DCCH} higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delay measured = 2*$T_{\text{Measurement Period, GSM}}$ + $T_{\text{identify, GSM}}$ + TTI insertion uncertainty + DRX cycle length

$T_{\text{Measurement Period, GSM}}$ = 480 ms (as specified in table 8.1.2.4.5.2.1-1 of TS36.133 [4] clause 8.1.2.4.5.2.1)

$T_{\text{identify, GSM}}$ = 2160 ms (as specified in table 8.1.2.4.5.1.2.1-1 of TS36.133 [4] clause 8.1.2.4.5.1.2.1)

TTI insertion uncertainty = 2 ms

DRX cycle length = 40 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 3162 ms.

The overall delay measured when DRX cycle length is 1280 ms test requirement is expressed as:

Overall delay measured = 2*$T_{\text{Measurement Period, GSM}}$ + N_{freq} * 30s + TTI insertion uncertainty + DRX cycle length

$T_{\text{Measurement Period, GSM}}$ = 6400 ms (as specified in table 8.1.2.4.5.2.1-1 of TS36.133 [4] clause 8.1.2.4.5.2.1)

N_{freq} = 1 (as specified in TS36.133 clause 8.1.2.1.1)

N_{freq} * 30 s = 30000 ms (as specified in TS36.133 [4] clause 8.1.2.4.5.2.2.2 for when DRX cycle length > 40 ms)

TTI insertion uncertainty = 2 ms

DRX cycle length = 1280 ms

The overall delay measured when DRX cycle length is 1280 ms shall be less than a total of 44082 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

8.11 Monitoring of Multiple Layers

8.11.1 Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties and test tolerances applicable to this test are undefined*
- *Statistical testing of cell re-selection delay performance requirements are undefined*

8.11.1.1 Test purpose

To verify that the UE makes correct reporting of multiple events under fading propagation conditions within the E-UTRA FDD inter-frequency cell search requirements.

8.11.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.11.1.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP$|_{dBm}\geq$ -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}\geq$ -124 dBm for Bands 9 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}\geq$ -123 dBm for Bands 2, 5, 7, 17 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}\geq$ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH_RP$|_{dBm}\geq$ -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP$|_{dBm}\geq$ -124 dBm for Band 9 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}\geq$ -123 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}\geq$ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês /Iot ≥ -4 dB.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.3 with measurement period given by Table 8.11.1.3-1.

Table 8.11.1.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.1.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.11.1.

8.11.1.4 Test description

8.11.1.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A. 19.

2. The general test parameter settings are set up according to Table 8.11.1.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.1.4.3.

5. In this test, there are three E-UTRA cells, cell1, cell2 and cell3, all on different frequencies. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.1.4.1-1: General test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
E-UTRA RF Channel Number		1, 2, 3	Three FDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2 and cell 3	Cell 2 is on RF channel number 2 and cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN FDD cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	10	

8.11.1.4.2 Test procedure

This test scenario comprised of 3 E-UTRA FDD cells operating on different frequencies. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 or cell 3. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A.

2. Set the parameters according to T1 in Table 8.11.1.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.1.5-1.

6. UE shall transmit MeasurementReport messages triggered by event A3 for cell 2 and cell 3, respectively. If the measurement reporting delay for cell 2 from the beginning of the time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one. If the measurement reporting delay for cell 3 from the beginning of time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

9. Repeat step 1-8 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

8.11.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.1.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.1.4.3-2: *MeasConfig-DEFAULT*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f3		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f3)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f3		
reportConfigId	idReportConfig-A3		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.1.4.3-3: *ReportConfigEUTRA-A3*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.1.4.3-4: *MeasResults*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[1]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.1.4.3-5: *MeasResultListEUTRA*: Additional Multiple E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

8.11.1.5 Test requirement

Table 8.11.1.4.1-1 and 8.11.1.5-1 define the primary level settings including test tolerances for three E-UTRAN FDD cells.

Table 8.11.1.5-1: Cell specific test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading conditions

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD		OP.2 FDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-98 + TT	-98 + TT	-Infinity	-95 + TT	-Infinity	-95 + TT
$\hat{E}_s/I_{ot}$	dB	0 + TT	0 + TT	-Infinity	3 + TT	-Infinity	3 + TT
SCH_RP Note 4	dBm/15 kHz	-98 + TT	-98 + TT	-Infinity	-95 + TT	-Infinity	-95 + TT
$\hat{E}_s/N_{oc}$	dB	0 + TT	0 + TT	-Infinity	3 + TT	-Infinity	3 + TT
Propagation Condition		AWGN		ETU70		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

The UE shall send one Event A3 triggered measurement report for cell 2 with a measurement reporting delay less than 7682 ms from the beginning of time period T2.

The UE shall send one Event A3 triggered measurement report for cell 3 with a measurement reporting delay less than 7682 ms from the beginning of time period T3.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to Cell 2.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = Measurement reporting delay + TTI insertion uncertainty

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

Therefore, the overall delays measured shall be less than a total of 7682ms in this test case (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.2 E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined.*
- Statistical testing of cell re-selection delay performance requirements are undefined

8.11.2.1 Test purpose

To verify that the UE makes correct reporting of two event when doing inter frequency measurements.

8.11.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

8.11.2.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm} \geq$ -125 dBm and for Bands 33, 34, 35, 36, 37, 38, 39, 40, 41 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm} \geq$ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 41 and SCH Ês/Iot ≥ -4 dB.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.4.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

Where:

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

8.11.2.4 Test description

8.11.2.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.19.

2. The general test parameter settings are set up according to Table 8.11.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.2.4.3.

5. There are three E-UTRA cells, cell1, cell2 and cell3, all on different frequencies in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.2.4.1-1: General test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
E-UTRA RF Channel Number		1, 2, 3	Three TDD carrier frequencies are used.
Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbor cells		Cell 2 and Cell 3	Cell 2 and 3 are on RF channel numbers 2 and 3 respectively
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 µs	Synchronous cells 3µs or 92*Ts
T1	s	5	
T2	s	10	

8.11.2.4.2 Test procedure

This test scenario comprised of 3 E-UTRA TDD cells operating on different frequency. The test consists of two successive time periods, with time duration T1 and T2. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.11.2.5-1and Table 8.11.2.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.2.5-1and Table 8.11.2.5-2.

6. UE shall transmit two MeasurementReport message triggered by two events A3 for cell 2 and cell 3, respectively. If the overall delay measured from the beginning of the time period T2 is less than 7682 ms for event A3 for cell 2 report then the number of successful tests is increased by one. If the UE fails to report the event A3 for cell 2 within the overall delays measured requirement then the number of failure tests is increased by one. If the overall delay measured from the beginning of time period T2 is less than 7682ms for event A3 for cell 3 report then the number of successful tests is increased by one. If the UE fails to report the event A3 for cell 3 within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

8.11.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.2.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1

Table 8.11.2.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.2.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.2.4.3-4: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[1]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.2.4.3-5: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE {			
cellglobalId-EUTRA	GlobalCellId-EUTRA		
tac-IDrackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult	Not present		
}			
}			

8.11.2.5 Test requirement

Tables 8.11.2.5-1 and 8.11.2.5-2 define the primary level settings including test tolerances for three E-UTRAN TDD cells.

Table A.8.11.2.5-1: Cell specific test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions cells

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number		1		2		3	
$BW_{channel}$	MHz	10		10		10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		OP.2 TDD	
PBCH_RA	dB	0		0		0	
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA Note 1	dB						
OCNG_RB Note 1	dB						
N_{oc} Note 3	dBm/15 kHz	-98					
RSRP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95
$\hat{E}_s/I_{ot}$	dB	0+TT	0+TT	-inf	3+TT	-inf	3+TT
SCH_RP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95
$\hat{E}_s/N_{oc}$	dB	0+TT	0+TT	-inf	3+TT	-inf	3+TT
Propagation Condition		AWGN		ETU70		ETU70	

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties and test tolerances applicable to this test are undefined*
- *Statistical testing of cell re-selection delay performance requirements are undefined*

8.11.3.1 Test purpose

To verify that the UE makes correct reporting of an event when doing inter frequency and UTRAN FDD measurements under fading propagation conditions.

8.11.3.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

8.11.3.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new detectable FDD inter-frequency cell within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm} \geq$ -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm} \geq$ -124 dBm for Bands 9 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm} \geq$ -123 dBm for Bands 2, 5, 7, 17 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm} \geq$ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm} \geq$ -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot ≥ -4 dB,
- $SCH\_RP|_{dBm} \geq$ -124 dBm for Band 9 and SCH Ês/Iot ≥ -4 dB,
- $SCH\_RP|_{dBm} \geq$ -123 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot ≥ -4 dB,
- $SCH\_RP|_{dBm} \geq$ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês /Iot ≥ -4 dB.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.3 with measurement period given by Table 8.11.3.3-1.

Table 8.11.3.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.3.3-1.

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\_inter}$ defined in TS 36.133 [4] clause 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period Tidentify_intra defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than TMeasurement_Period Intra provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1 and A.8.11.3.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable FDD UTRA cell belonging to the monitored set within.

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

A cell shall be considered detectable when

- CPICH Ec/Io $\geq$ -20 dB,
- SCH_Ec/Io $\geq$ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

When measurement gaps are scheduled for UTRA FDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] section 9.2 with measurement period given by

$$T_{measurement\_UTRA\_FDD} = Max\left\{ T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \right\} ms$$

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA\_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_FDD.}$

$X_{basic\ measurement\ UTRA\_FDD} = 6$

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period $T_{measurement\_UTRA\_FDD}$ for UTRA FDD CPICH measurements.

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms. This is the time period used in the inter RAT equation in TS 36.133 [4] section 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_identify\_enhanced\_UTRA\_FDD}$ = 60 ms. This is the time period used in the inter RAT equation in section 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

$T_{basic\_measurement\_UTRA\_FDD}$ = 50 ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_FDD}$ defined in TS 36.133 [4]section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\ UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\ enhanced\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.1a for the enhanced requirements and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement\_UTRA\_FDD}$ defined in TS 36.133 [4] section 8.1.2.4.1.1.2 provided the timing to that cell has not changed more than ± 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.1.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.1 and A.8.11.3.

8.11.3.4 Test description

8.11.3.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A. 195.

2. The general test parameter settings are set up according to Table 8.11.3.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.3.4.3.

5. In this test, there are two cells on different carrier frequencies and one cell on UTRAN carrier frequency. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.3.4.1-1: General test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.2.1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
E-UTRAN FDD measurement quantity		RSRP	
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/N0	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dB	-88	RSRP threshold for event B2.
b2-Threshold-UTRA	dB	-18	CPICH Ec/N0 threshold for event B2.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
Time offset between cells		3 ms	Asynchronous cells
T1	s	5	
T2	s	8	

8.11.3.4.2 Test procedure

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A.

2. Set the parameters according to T1 in Table 8.11.3.5-1. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.3.5-1.

6. UE shall transmit MeasurementReport messages triggered by event A3 and B2. If the measurement reporting delay for event A3 from the beginning of the time period T2 is less than 7682 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one. If the measurement reporting delay for event B2 from the beginning of time period T2 is less than 4802 ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 primary scrambling code = ((current cell 3 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. Repeat step 1-8 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

8.11.3.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.3.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.3.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 *MeasConfig-DEFAULT*:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	3 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	serving frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
MeasObjectUTRA	MeasObjectEUTRA-GENERIC(8)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	2 entry		
reportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
eportConfigToAddMod ::= SEQUENCE {			
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	2 entry		
measIdToAddMod ::= SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
measIdToAddMod ::= SEQUENCE {			
measId	2		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-B2		
}			
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.3.4.3-4: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	53(-88dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in [36.133]	
b2-Threshold2 CHOICE {			
B2-Threshold-UTRA CHOICE {			
thresholdUTRA- EcN0	13 (-18dBm)	UTRA-Thres is actual CPICH Ec/N0 value in dBm	UTRA-FDD
}			
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.11.3.4.3-5 *MeasResults*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[1]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
}			

Table 8.11.4.4.3-7: *MeasuredResults*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[2]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.11.4.4.3-8: *MeasResultListUTRA*: Additional E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD	INTEGER (0..127)	
}			
measResult SEQUENCE {			
utra- EcN0		Set according to specific test INTEGER (-5..91)	
}			
}			

8.11.3.5 Test requirement

Table 8.11.3.5-1 and 8.11.3.5-2 define the primary level settings including test tolerances for two E-UTRAN FDD cells and one UTRAN FDD cell.

Table 8.11.3.5-1: Cell specific test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and in D1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA[Note 1]	dB				
OCNG_RB[Note 1]	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94 + TT	-94 + TT	-Infinity	-91 + TT
$\hat{E}_s/I_{ot}$	dB	4 + TT	4 + TT	-Infinity	7 + TT
SCH_RP Note 4	dBm/15 kHz	-94 + TT	-94 + TT	-Infinity	-91 + TT
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT	-Infinity	7 + TT
Propagation Condition		AWGN		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.11.3.5-1: Cell specific test parameters for UTRAN FDD (cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 3	
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/Ior	dB	-10	
PCCPCH_Ec/Ior	dB	-12	
SCH_Ec/Ior	dB	-12	
PICH_Ec/Ior	dB	-15	
DPCH_Ec/Ior	dB	N/A	
OCNS		-0.941	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8
I_{oc}	dBm/3.84 MHz	-70	
CPICH_Ec/Io	dB	-Infinity	-14
Propagation Condition		Case 5 (Note 3)	
Note 1: The DPCH level is controlled by the power control loop. Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I_{or}. Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.			

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 4802 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

Therefore, the overall delays of Event A3 triggered measurement report measured shall be less than a total of 7682ms in this test case (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

Similarly, the overall delays measured test requirement for Event B2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,\ UTRA\_FDD}$

$$\mathrm{T}_{\text{identify,}\ \ \text{UTRA\_FDD}} = \mathrm{T}_{\text{basic\_identify\_UTRA\_FDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} \cdot N_{Freq} \quad ms$$

$T_{basic\_identify\_UTRA\_FDD}$ = 300 ms

T_{Inter1} = 30 ms

N_{Freq} = 1

TTI insertion uncertainty = 2 ms

Therefore, the overall delays of Event B2 triggered measurement report measured shall be less than a total of 4802 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined.*
- Statistical testing of cell re-selection delay performance requirements are undefined

8.11.4.1 Test purpose

To verify that the UE makes correct reporting of an event when doing inter frequency measurements and UTRA TDD measurements.

8.11.4.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward that support UTRA TDD.

8.11.4.3 Minimum conformance requirements

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$\mathrm{T}_{\text{Identify\_Inter}} = \mathrm{T}_{\text{Basic\_Identify\_Inter}} \cdot \frac{480}{\mathrm{T}_{\text{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

A cell shall be considered detectable provided following conditions are fulfilled:

- $RSRP|_{dBm} \geq -125$ dBm and for Bands 33, 34, 35, 36, 37, 38, 39, 40 and RSRP Ês/Iot ≥ -4 dB,
- $RSRP|_{dBm} \geq -124$ dBm for Band 41 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- $SCH\_RP|_{dBm} \geq -125$ dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot ≥ -4 dB,.- $SCH\_RP|_{dBm} \geq -124$ dBm for Band 41 and SCH Ês/Iot ≥ -4 dB.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 sub-clause 9.1.3 with measurement period ($T_{Measurement\_Period\_TDD\_Inter}$) given by table 8.4.4.1.3-1.

Table 8.4.1.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional. Note 2: T_s is defined in 3GPP TS 36.211 [9].						

Where:

T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter.}$

Reported measurements contained in event triggered measurement reports shall meet the requirements in TS 36.133 [4] clause 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: [2] x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify\_Inter}$ defined in TS 36.133 [4] clause 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify\_intra}$ defined in TS 36.133 [4] section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\ Intra}$ provided the timing to that cell has not changed more than ± 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

The measurement reporting delay shall be less than $T_{identify,\ UTRA\_TDD}$ in RRC_CONNECTED state.

When explicit neighbour list is provided and no DRX is used the UE shall be able to identify a new detectable cell belonging to the monitored set within

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not require transmit gap to perform inter-RAT UTRA TDD measurements, the UE shall be able to identify a new detectable inter-RAT UTRA TDD cell belonging to the monitored set within 5000 ms.

A cell shall be considered detectable when

- P-CCPCH Ec/Io $\geq$ -8 dB,
- DwPCH_Ec/Io $\geq$ -5 dB.

When L3 filtering is used an additional delay can be expected.

When transmission gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS 36.133 [4] clause 9.3 with measurement period given by

$$T_{measurement\ UTRA\_TDD} = Max\left\{T_{Measurement\_Period\ UTRA\_TDD}, T_{basic\ measurement\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA\_TDD}$ inter-frequency cells per TDD frequency of the monitored set and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_\ UTRA\_TDD.}$

$X_{basic\ measurement\ TDDinter} = 6$

$T_{Measurement\_Period\ UTRA\_TDD}$ = 480 ms is the period used for calculating the measurement period $T_{measurement\_UTRA\_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

N_{freq} and T_{inter1} are defined in TS 36.133 [4] section 8.1.2.1.1

Reported measurements in periodically triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

Reported measurements in event triggered measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The measurement reporting delay is defined as the time between any events that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA\_TDD}$ defined in TS 36.133 [4] Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS 36.133 [4] section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in TS 36.133 [4] section 8.1.2.4.3.1.4 Event Triggered Reporting.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.3.

8.11.4.4 Test description

8.11.4.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.14.
2. The general test parameter settings are set up according to Table 8.11.4.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are as defined in clause 8.11.4.4.3.
5. There are two E-UTRA TDD cells operating on different frequency and one UTRA TDD cell specified in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.4.4.1-1: General test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cells search under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
Active cell		Cell 1	E-UTRA TDD cell is on RF channel number 1
Neighbour cell		Cell 2	E-UTRA TDD cell is on RF channel number 2
		Cell 3	1.28Mcps TDD cell
CP length of cell1 and cell2		Normal	
Uplink-downlink configuration of cell1 and cell2		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Special subframe configuration of cell1 and cell2		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN TDD measurement quantity		RSRP	
UTRAN TDD measurement quantity		RSCP	
DRX		OFF	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hys	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	Parameter for A3 event
Thresh1	dBm	-88	Absolute E-UTRAN RSRP threshold for event B2
Thresh2	dBm	-83	Absolute UTRAN RSCP threshold for event B2
Hysteresis	dB	0	
TimeToTrigger	dB	0	
Filter coefficient		0	L3 filtering is not used
T1	s	>5	During T1, cell 2 and cell 3 shall be powered off. During the off time the physical layer cell identity of cell 2 shall be changed, and the scrambling code of cell 3 shall be changed.
T2	s	15	

8.11.4.4.2 Test procedure

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 UTRA TDD cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.11.4.5-1and Table 8.11.4.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.4.5-1and Table 8.11.4.5-2.

6. UE shall transmit a MeasurementReport message triggered by event A3 and B2. If the overall delays measured from the beginning of time period T2 is less than 7760 ms for event A3 report then the number of successful tests is increased by one. If the UE fails to report the event A3 within the overall delays measured requirement

then the number of failure tests is increased by one. If the overall delay measured from the beginning of time period T2 is less than 12.88s for event B2 report then the number of successful tests is increased by one. If the UE fails to report the event B2 within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. Set Cell 3 primary scrambling code = ((current cell 3 primary scrambling code - 50) mod 200 + 100) for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

8.11.4.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 8.11.4.4.3-1: Common Exception messages

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-7

Table 8.11.4.4.3-2: *MeasConfig-DEFAULT*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigEUTRA-A3 ReportConfigInterRAT-B2-UTRA		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.11.4.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-6 ReportConfigEUTRA-A3			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	-12 (-6 dB)	-6 is actual value in dB (-6 * 0.5 dB)	
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.11.4.4.3-4: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.508 clause 4.6.6 Table 4.6.6-7B			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigInterRAT-B2-UTRA(UTRA-Thres) ::= SEQUENCE {			
triggerType CHOICE {			
event SEQUENCE {			
eventId CHOICE {			
eventB2 SEQUENCE {			
b2-Threshold1 CHOICE {			
threshold-RSRP	53(-88dBm)	INTEGER(0..97), the mapping table is Table 9.1.4-1 in [36.133]	
b2-Threshold2 CHOICE {			
B2-Threshold-UTRA CHOICE {			
thresholdUTRA-RSCP	32(UTRA-Thres + 115)	UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
Hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.11.4.4.3-5: *MeasResults*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[1]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 8.11.4.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN TDD-TDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF MeasResultEUTRA {			
MeasResultEUTRA ::= SEQUENCE {			
physCellId	PhysicalCellIdentity		
cgi-Info SEQUENCE {			
cellglobalId-EUTRA	GlobalCellId-EUTRA		
tac-IDrackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult	Not present		
}			
}			

Table 8.11.4.4.3-7: *MeasuredResults*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	[2]		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 8.11.4.4.3-8: *MeasResultListUTRA*: Additional E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
tdd	PhysCellIdUTRA-TDD	INTEGER (0..127)	
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
locationAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSRP		Set according to specific test INTEGER (-5..91)	
}			
}			

8.11.4.5 Test requirement

Tables 8.11.4.5-1 and 8.11.4.5-2 define the primary level settings including test tolerances for two E-UTRAN TDD cells and one UTRAN FDD cell.

Table 8.11.4.5-1: Cell specific test parameters for combined E-UTRAN TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
BWchannel	MHz	10		10	
OCNG Pattern defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT	-Infinity	7+TT
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	7+TT
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
SCH_RP	dBm/15 kHz	-94+TT	-94+TT	-infinity	-91+TT
Propagation Condition		AWGN		ETU70	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 8.11.4.5-2: Cell specific test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cell search under fading propagation conditions (cell3)

Parameter	Unit	Cell 3 (UTRA)			
Timeslot Number		0		DwPTS	
		T1	T2	T1	T2
UTRA RF Channel Number*		Channel 3			
PCCPCH_Ec/Ior	dB	-3			
DwPCH_Ec/Ior	dB			0	
OCNS_Ec/Ior	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	9+TT	-Infinity	9+TT
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-Infinity	-74+TT	n.a.	
Propagation Condition		Case 3			

Note1: The DPCH of all cells are located in a timeslot other than 0.
Note2: In the case of multi-frequency network, the UTRA RF Channel Number can be set for the primary frequency in this test.
Note3: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The actual overall delays measured in the test may be up to 2xTTI_{DCCH} higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

Similarly, the overall delays measured test requirement for Event B2 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify,UTRA\_TDD}$

$$T_{identify,\ UTRA\_TDD} = Max\left\{5000, T_{basic\ identify\ UTRA\_TDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$T_{basic\_identify\_UTRA\_TDD}$ = 800 ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

$T_{basic\_measurement\_UTRA\_TDD}$ = 50 ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 1202m8s from the beginning of time period T2 (note: this gives a total of 12.8 s for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

8.11.5 Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*

- *The Test tolerances applicable to this test are undefined.*
- *Statistical testing of cell re-selection delay performance requirements are undefined*
- *The message contents section is not completed*
- *The requirement for event B2 is still within brackets in the core spec.*

8.11.5.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements.

8.11.5.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GSM.

8.11.5.3 Minimum conformance requirements

E-UTRAN part:

When measurement gaps are scheduled the UE shall be able to identify a new FDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP$|_{dBm}$≥ -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}$≥ -124 dBm for Bands 9 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}$≥ -123 dBm for Bands 2, 5, 7, 17 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}$≥ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH_RP$|_{dBm}$≥ -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP$|_{dBm}$≥ -124 dBm for Band 9 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}$≥ -123 dBm for Bands 2, 5, 7, 17 and SCH Ês/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}$≥ -122 dBm for Bands 3, 8, 12, 13, 14, 20 and SCH Ês/Iot ≥ -4 dB.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS36.133 sub-clause 9.1.3 with measurement period given by table 8.11.5.3-1.

Table 8.11.5.3-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: $T_{Measurement\_Period\_Inter\_FDD}$ [ms]	Measurement bandwidth [RB]
0	480 x N_{freq}	6
1 (Note)	240 x N_{freq}	50
TBD	TBD	TBD
Note: This configuration is optional		

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.11.5.3-1.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH . The delay uncertainty is: [2] x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS36.133 [4] section 8.1.2.3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_interint}$er defined in TS36.133 [4] section 8.1.2.3.1.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ defined in TS36.133 [4] section 8.1.2.3.1.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.1.

GSM part:

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as:

$$N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm} + N_{freq,\ cdma2000} + N_{freq,\ HRPD}$$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

$N_{freq,\ cdma2000}$ is the number of cdma2000 carriers being monitored

$N_{freq,\ HRPD}$ is the number of HRPD carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms,

M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to [ceil ($N_{carriers,\ GSM}$ /20)] where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

BSIC verification:

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].

- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.5 and A.8.11.5

8.11.5.4 Test description

8.11.5.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator), AWGN noise source and Fader to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.[FFS].

2. The general test parameter settings are set up according to Table 8.11.5.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.5.4.3.

5. There are two E-UTRA FDD cells operating on different frequency and one GSM cell specified in the test. Cell 1 (EUTRA FDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.5.4-1: General test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth ($BW_{channel}$)	MHz	10	
E-UTRAN FDD measurement quantity		RSRP	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hys	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN FDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dBm	-85	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA serving cell RSCP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	10	

8.11.5.4.2 Test procedure

This test scenario comprised of 2 E-UTRA FDD cells operating on different frequency, and 1 GSM cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.11.5.5-1and Table 8.11.5.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.5.5-1and Table 8.11.5.5-2.

6. UE shall transmit a MeasurementReport message triggered by event A3 and B2. If the overall delays measured from the beginning of time period T2 is less than 7682 ms for event A3 report then the number of successful tests is increased by one. If the UE fails to report the event A3 within the overall delays measured requirement then the number of failure tests is increased by one. If the overall delays measured from the beginning of time period T2 is less than XXX[7202] ms for event B2 report then the number of successful tests is increased by one. If the UE fails to report the event B2 within the overall delays measured requirement then the number of failure tests is increased by one.

7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. The SS shall set a different BSIC on Cell 3, as the previous timing information of Cell 3 is invalid in the UE for the next iteration of the test procedure loop.

9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.

10. Repeat step 1-9 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

8.11.5.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

[FFS]

8.11.5.5 Test requirement

Tables 8.11.5.5-1 and 8.11.5.5-2 define the primary level settings including test tolerances for two E-UTRAN FDD cells and one GSM cell.

Table 8.11.5.5-1: Cell specific test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in DA.3.2.1.1 (OP.1 FDD) and in DA.3.2.1.2 (OP.2 FDD)		OP.1 FDD		OP.2 FDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT	-Infinity	7+TT
SCH_RP Note 4	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	7+TT
Propagation Condition		ETU70		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.11.5.5-2: Cell specific test parameters for Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell3)

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75+TT
GSM BSIC		N/A	Valid

The actual overall delays measured in the test may be up to 2xTTI$_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delays measured test requirement for Event B2 is:

The delay for GSM cell identification with BSIC verified is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = 2*$T_{Measurement Period, GSM}$ = 2* N_{freq}*480ms = 1920ms.

Initial BSIC identification delay = [5280] ms, when one carrier frequency other than GSM is monitored in the gaps (table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]).

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than [7202]ms from the beginning of time period T2 (note: this gives a total of [7200] ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

8.11.6 Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined.*
- *Statistical testing of cell re-selection delay performance requirements are undefined*
- *The message contents section is not completed*
- *The requirement for event B2 is still within brackets in the core spec.*

8.11.6.1 Test purpose

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements.

8.11.6.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support GSM.

8.11.6.3 Minimum conformance requirements

E-UTRAN part:

When measurement gaps are scheduled the UE shall be able to identify a new TDD inter-frequency within $T_{Identify\_Inter}$ according to the following expression:

$$\mathrm{T}_{\mathrm{Identify\_Inter}} = \mathrm{T}_{\mathrm{Basic\_Identify\_Inter}} \cdot \frac{480}{\mathrm{T}_{\mathrm{Inter1}}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

N_{freq} is defined in TS 36.133 [4] section 8.1.2.1.1 and T_{inter1} is defined in TS 36.133 [4] section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP$|_{dBm}$ ≥ -125 dBm and for Bands 33, 34, 35, 36, 37, 38, 39, 40 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}$ ≥ -124 dBm and for Band 41 and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH_RP$|_{dBm}$≥ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot ≥ -4 dB ,
- SCH_RP$|_{dBm}$≥ -124 dBm for Band 41 and SCH Ês/Iot ≥ -4 dB.

When measurement gaps are scheduled for TDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in TS36.133 sub-clause 9.1.3 with measurement period given by table 8.11.6.3-1.

Table 8.11.6.3-1: $T_{Measurement\_Period\_TDD\_Inter}$ for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub-frames per half frame (5 ms)		DwPTS		$T_{Measurement\_Period\_TDD\_Inter}$ [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N_{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N_{freq}
Note 1: This configuration is optional Note 2: T_s is defined in 3GPP TS 36.211 [9]						

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{Measurement\_Period\_TDD\_Inter}$.

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in TS36.133 [4] section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: [2] x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ -inter}$ defined in TS36.133 [4] section 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_interint}$er defined in TS36.133 [4] section 8.1.2.3.12.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_TDD\ Inter\_FDD}$ defined in TS36.133 [4] section 8.1.2.3.2.1 provided the timing to that cell has not changed more than ± 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.3.2.

GSM part:

Measurements on GSM cells can be requested with BSIC verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in TS 36.133 [4] is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns.

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1 in TS 36.133 [4] A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is N_{freq} * 480 ms. The parameter N_{freq} is defined in clause 8.1.2.1.1 [4] as:

$N_{freq} = N_{freq,\ E\text{-}UTRA} + N_{freq,\ UTRA} + M_{gsm} + N_{freq,\ cdma2000} + N_{freq,\ HRPD}$

Where:

$N_{freq,\ E\text{-}UTRA}$ is the number of E-UTRA carriers being monitored

$N_{freq,\ UTRA}$ is the number of UTRA carriers being monitored

$N_{freq,\ cdma2000}$ is the number of cdma2000 carriers being monitored

$N_{freq,\ HRPD}$ is the number of HRPD carriers being monitored

M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a Measurement Gap Repetition Period (MGRP) of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to [ceil ($N_{carriers,\ GSM}$ /20)] where $N_{carriers,\ GSM}$ is the number of GSM carriers on which cells are being measured

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008 [15], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

BSIC verification:

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN TDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1 of TS 36.133 [4].
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2 of TS 36.133 [4].

If the network requests measurements on a GSM cell, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in TS 36.133 [4] when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in TS 36.331 [5].
- The UE shall perform BSIC identification if BSIC verified measurements are activated by RRC. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to TS 36.331 [5].

The BSIC of a GSM cell is considered to be “verified” if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every $8*T_{re\text{-}confirm,GSM}$ seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

$T_{identify,GSM}$ indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

$T_{re\text{-}confirm,GSM}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1 of TS 36.133 [4].

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in TS 45.005 [16].

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2 of TS 36.133 [4].

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall immediately continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $T_{identify,GSM}$ ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

$T_{identify,GSM}$ values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier.

Reported measurements in event triggered measurement reports shall meet the requirements in section TS 36.331 [5].

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{Measurement\ Period,\ GSM}$ (see section 8.1.2.4.5.1 of TS 36.133 [4]).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.1. of TS 36.133 [4] When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.4.6 and A.8.11.6

8.11.6.4 Test description

8.11.6.4.1 Initial conditions

Test Environment: Normal, as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator), AWGN noise source and Fader to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A.[FFS].

2. The general test parameter settings are set up according to Table 8.11.6.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are as defined in clause 8.11.6.4.3.

5. There are two E-UTRA TDD cells operating on different frequency and one GSM cell specified in the test. Cell 1 (EUTRA TDD cell on RF channel number 1) is the cell used for registration with the power level set according to Annex C.0 and C.1 for this test.

Table 8.11.6.4-1: General test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2.
Special subframe configuration of cell1 and cell2		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration of cell1 and cell2		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth ($BW_{channel}$)	**MHz**	10	
E-UTRAN TDD measurement quantity		RSRP	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hys	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E-UTRAN TDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
b2-Threshold-E-UTRA	dBm	-85	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA serving cell RSCP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	s	5	
T2	s	10	

8.11.6.4.2 Test procedure

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 GSM cell. The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used. At T1 the UE is camped on to Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to T1 in Table 8.11.6.5-1and Table 8.11.6.5-2. T1 starts.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 8.11.6.5-1and Table 8.11.6.5-2.
6. UE shall transmit a MeasurementReport message triggered by event A3 and B2. If the overall delays measured from the beginning of time period T2 is less than 7682 ms for event A3 report then the number of successful tests is increased by one. If the UE fails to report the event A3 within the overall delays measured requirement then the number of failure tests is increased by one. If the overall delays measured from the beginning of time period T2 is less than [7202] ms for event B2 report then the number of successful tests is increased by one. If the UE fails to report the event B2 within the overall delays measured requirement then the number of failure tests is increased by one.
7. After the SS receives the MeasurementReport messages in step 6 or when T2 expires, the SS shall transmit RRCConnectionRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop. The SS shall set a different BSIC on Cell 3, as the previous timing information of Cell 3 is invalid in the UE for the next iteration of the test procedure loop.
9. After the RRC connection release, the SS transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE, or switches off the UE.
10. Repeat step 1-9 until the confidence level according to Table G.2.6-1 in Annex G clause G.2 is achieved.

8.11.6.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

[FFS]

8.11.6.5 Test requirement

Tables 8.11.6.5-1 and 8.11.6.5-2 define the primary level settings including test tolerances for two E-UTRAN TDD cells and one GSM cell.

Table 8.11.6.5-1: Cell specific test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell1 and cell2)

Parameter	Unit	Cell 1		Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel Number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and in D.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD	
PBCH_RA	dB	0		0	
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB				
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				

N_{oc} Note 3	dBm/15 kHz	-98			
RSRP Note 4	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
$\hat{E}_s/I_{ot}$	dB	4+TT	4+TT	-Infinity	7+TT
SCH_RP Note 4	dBm/15 kHz	-94+TT	-94+TT	-Infinity	-91+TT
$\hat{E}_s/N_{oc}$	dB	4+TT	4+TT	-Infinity	7+TT
Propagation Condition		ETU70		ETU70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table 8.11.6.5-2: Cell specific test parameters for Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions (cell3)

Parameter	Unit	Cell 3	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75+TT
GSM BSIC		N/A	Valid

The actual overall delays measured in the test may be up to 2xTTI$_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement for Event A3 is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay = $T_{identify\_inter}$

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Inter1}} \cdot N_{freq} \quad ms$$

Where:

$T_{Basic\_Identify\_Inter}$ = 480 ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

T_{inter1}=60ms

N_{freq}=2.

TTI insertion uncertainty = 2 ms

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7682ms from the beginning of time period T2 (note: this gives a total of 7680 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The overall delays measured test requirement for Event B2 is:

The delay for GSM cell identification with BSIC verified is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = 2*$T_{Measurement\ Period,\ GSM}$ = 2* N_{freq}*480ms = 1920ms.

Initial BSIC identification delay = [5280] ms, when one carrier frequency other than GSM is monitored in the gaps (table 8.1.2.4.5.1.2.1-1 of TS 36.133 [4]).

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than [7202]ms from the beginning of time period T2 (note: this gives a total of [7200] ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

9 Measurement Performance Requirements

When the UE is in RRC_CONNECTED state on a cell, physical layer measurements as defined in TS 36.214 [12] clause 5 are initiated and reported to higher layers. To initiate a specific measurement, the System Simulator sends a 'RRC Connection Reconfiguration message' to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects, the measurement quantity, the reporting quantities and the reporting criteria (periodical/event-triggered), the physical layer measurement process takes place. In this process when the reporting criteria are fulfilled the UE sends a 'Measurement Report message' to the System Simulator including the measurement ID and the results. The reporting criteria that trigger the UE to send a 'Measurement Report message' to the System Simulator is periodical as defined in TS 36.331 [5] clause 5.5.4. The physical layer measurements succeed only if the performance results in terms of accuracy are within the specified limits.

Since the UE reference sensitivity requirements are different depending on supported band, this is noted in each case with definition of the range Io for each frequency band.

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions and assume independent interference (noise) at each receiver antenna port.

The reported measurement results after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period.

The accuracy requirements are valid for the reported measurement results after layer 1 filtering.

Unless explicitly stated:

- In state RRC_CONNECTED
- Reported measurements shall be within defined range in 90 % of the cases.
- Measurement channel is as defined in Annex A. This measurement channel is used both in active cell and cells to be measured.
- The reference channels assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.
- SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Annex A1. The SS sends downlink MAC padding bits on the DL RMC.
- Uplink is configured according to Annex A.3.
- Propagation condition is AWGN as defined in Annex B.
- Physical channels used as defined in Annex C.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

9.1 RSRP

9.1.1 FDD Intra frequency RSRP Accuracy

9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy

9.1.1.1.1 Test purpose

To verify that the FDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.1.1.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.1.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39 and 40

RSRP|dBm≥ -126 dBm for Bands 9

$RSRP|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 17

$RSRP|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14, 20

Table 9.1.1.1.3-1: RSRP FDD Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14, 20	Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6	±9	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -70dBm/ $BW_{Channel}$	-118dBm/15kHz … -70dBm/ $BW_{Channel}$	-120dBm/15kHz … -70dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8	±11	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$]
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.1.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.1.

9.1.1.1.4 Test description

9.1.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.1.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.1.4.2 Test procedure

1. Ensure that the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.1.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check RSRP reported value in MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.1.1.5-3.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.1.1.5-2 as appropriate.

9.1.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.1.4.3-1: Common Exception messages for RSRP FDD Intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.1.4.3-2: *MeasResults*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.1.5 Test requirement

Table 9.1.1.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.1.1.5-3.

Table 9.1.1.1.5-1: Void

Table 9.1.1.1.5-2: RSRP FDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-106.7		-88.0		-116.0	
	Bands 2, 5, 7 and 17						-114.0	
	Bands 3, 8, 12, 13, 14 and 20						-113.0	
	Band 9						-115.0	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-100.7	-104.7	-82.0	-86.0	-113.0	-116.2
	Bands 2, 5, 7 and 17						-111.0	-114.2
	Bands 3, 8, 12, 13, 14						-110.0	-113.2
	Band 9						-112.0	-115.2
Io Note3	Bands 1, 4, 6,10, 11, 18, 19 and 21	dBm/9 MHz	-70.75		-52.05		-82.25	
	Bands 2, 5, 7 and 17						-80.25	
	Bands 3, 8, 12, 13, 14 and 20						-79.25	
	Band 9						-81.25	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	-0.2
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.1.1.5-3: RSRP FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3			
	All bands	**All bands**	**Bands 1, 4, 6, 10, 11, 18, 19 and 21**	**Bands 2, 5, 7, and 17**	**Bands 3, 8, 12, 13, 14**	**Band 9**
Normal Conditions						
Lowest reported value (Cell 2)	RSRP_29	RSRP_45	RSRP_17	RSRP_19	RSRP_20	RSRP_18
Highest reported value (Cell 2)	RSRP_43	RSRP_64	RSRP_32	RSRP_34	RSRP_35	RSRP_33
Extreme Conditions						
Lowest reported value (Cell 2)	RSRP_26	RSRP_42	RSRP_14	RSRP_16	RSRP_17	RSRP_15
Highest reported value (Cell 2)	RSRP_46	RSRP_67	RSRP_35	RSRP_37	RSRP_38	RSRP_36

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP

9.1.1.2.1 Test purpose

To verify that the FDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.1.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.1.1.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in table 9.1.1.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1,2|_{dBm} \geq$ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40

$RSRP1,2|_{dBm} \geq$ -126 dBm for Bands 9, 41

$RSRP1,2|_{dBm} \geq$ -125 dBm for Bands 2, 5, 7, 17

$RSRP1,2|_{dBm} \geq$ -124 dBm for Bands 3, 8, 12, 13, 14, 20

Table 9.1.1.2.3-1: RSRP FDD Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14, 20	Bands 9, 41
				Io	Io	Io	Io
RSRP for Ês/Iot > -3 dB	dBm	±2	±3	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±3	±3	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.1.

9.1.1.2.4 Test description

9.1.1.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20 .
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.1.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.1.2.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.1.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.1.2.5-3.

7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.1.2.5-2 as appropriate.

9.1.1.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.1.2.4.3-1: Common Exception messages for RSRP FDD Intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.2.4.3-2: *MeasResults*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.1.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.1.2.5 Test requirement

Table 9.1.1.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD intra-frequency relative accuracy test shall meet the RSRP accuracy requirements in table 9.1.1.2.5-3.

Table 9.1.1.2.5-1: Void

Table 9.1.1.2.5-2: RSRP FDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-106.00	-106.00	-88.00	-88.00	-116.00	
	Bands 2, 5, 7, 17						-114.00	
	Bands 3, 8, 12, 13, 14 and 20						-113.00	
	Band 9						-115.00	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP Note3	Bands 1, 4, 6,10, 11, 18, 19 and 21	dBm/15 kHz	-100.00	-104.00	-82.00	-86.00	-113.00	-116.00
	Bands 2, 5, 7 and 17						-111.00	-114.00
	Bands 3, 8, 12, 13, 14 and 20						-110.00	-113.00
	Band 9						-112.00	-115.00
Io Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
	Bands 2, 5, 7 and 17						-80.20	
	Bands 3, 8, 12, 13, 14 and 20						-79.20	
	Band 9						-81.20	
$\hat{E}_s/N_{oc}$		dB	6.00	1.00	6.00	1.00	3.00	0.00
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.1.2.5-3: RSRP FDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3			
	All bands	All bands	Bands 1, 4, 6, 10, 11,18 and 19	Bands 2, 5, 7 and 17	Bands 3, 8, 12,13 and 20	Band 9
Normal Conditions						
Lowest reported value (Cell 2)	RSRP_x-9	RSRP_x-9	RSRP_x-8	RSRP_x-8	RSRP_x-8	RSRP_x-8
Highest reported value (Cell 2)	RSRP_x+1	RSRP_x+1	RSRP_x+2	RSRP_x+2	RSRP_x+2	RSRP_x+2
Extreme Conditions						
Lowest reported value (Cell 2)	RSRP_x-9	RSRP_x-9	RSRP_x-8	RSRP_x-8	RSRP_x-8	RSRP_x-8
Highest reported value (Cell 2)	RSRP_x+1	RSRP_x+1	RSRP_x+2	RSRP_x+2	RSRP_x+2	RSRP_x+2
RSRP_x is the reported value of Cell 1						

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2 TDD Intra frequency RSRP Accuracy

9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy

9.1.2.1.1 Test purpose

To verify that the TDD intra-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.1.2.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 21, 33, 34, 35, 36, 37, 38, 39, 40RSRP|dBm≥ -126 dBm for Bands 9, 41

$RSRP|_{dBm}\geq$ -125 dBm for Bands 2, 5, 7,

$RSRP|_{dBm}\geq$ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20.

Table 9.1.2.1.3-1: RSRP TDD Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6	±9	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -70dBm/ $BW_{Channel}$	-118dBm/15kHz … -70dBm/ $BW_{Channel}$	-120dBm/15kHz … -70dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8	±11	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.1.3-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
…	…	…
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.1, clause 9.1.4 and A.9.1.2.

9.1.2.1.4 Test description

9.1.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.1.2.1.4.3.

4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.1.4.2 Test procedure

1. Ensure that the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to Table 9.1.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell 1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check RSRP reported value in MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to actual RSRP value according to Table 9.1.2.1.5-3.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.2.1.5-2 as appropriate.

9.1.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.1.4.3-1: Common Exception message for RSRP TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.1.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult			
rsrqResult	Not present		
}			
}			

9.1.2.1.5 Test requirement

Table 9.1.2.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.2.1.5-3.

Table 9.1.2.1.5-1: Void

Table 9.1.2.1.5-2: RSRP TDD Intra frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-106.7	-106.7	-88.0	-88.0	-116.0	
	Band 41						-115.0	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	0.09	-4.96
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40,	dBm/15 kHz	-100.7	-104.7	-82.0	-86.0	-113	-116.2
	Band 41						-112	-115.2
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-70.75	-70.75	-52.05	-52.05	-82.52	
	Band 41						-82.52	
$\hat{E}_s/N_{oc}$		dB	6	2	6	2	3	-0.20
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.2.1.5-3: RSRP TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_29	RSRP_45	RSRP_17
Highest reported value (Cell 2)	RSRP_43	RSRP_64	RSRP_32
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_26	RSRP_42	RSRP_14
Highest reported value (Cell 2)	RSRP_46	RSRP_67	RSRP_35

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.2.2 TDD Intra Frequency Relative Accuracy of RSRP

9.1.2.2.1 Test purpose

To verify that the TDD intra-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.2.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.1.2.2.3 Minimum conformance requirements

The relative accuracy of RSRP is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on the same frequency.

The accuracy requirements in Table 9.1.2.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP1,2$|_{dBm}$≥ -127 dBm for Bands 1, 4, 6, 10, 11, 21, 33, 34, 35, 36, 37, 38, 39, 40RSRP1,2$|_{dBm}$≥ -126 dBm for Bands 9, 41,

RSRP1,2$|_{dBm}$≥ -125 dBm for Bands 2, 5, 7,

RSRP1,2$|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20.

Table 9.1.2.2.3-1: RSRP TDD Intra frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				Io	Io	Io	Io
RSRP for Ês/Iot > -3 dB	dBm	±2	±3	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±3	±3	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.2.2, clause 9.1.4 and A.9.1.2.

9.1.2.2.4 Test description

9.1.2.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS and AWGN noise source to the UE antenna connectors as shown in TS 36.508 [7] Annex A Figure A. 20.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.2.2.4.3.
4. All cells are in the same carrier frequency. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.2.2.4.2 Test procedure

1. Ensure that the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.2.2.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the reported RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP measurement value for Cell 2 is compared to the reported RSRP measurement value for Cell 1 for each MeasurementReport message according to Table 9.1.2.2.5-3.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.2.2.5-2 as appropriate.

9.1.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.2.2.4.3-1: Common Exception messages for RSRP TDD intra frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.2.2.4.3-2: *MeasResults*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	INTEGER(0..97)		
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.2.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	physCellId of Cell2		
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.2.2.5 Test requirement

Table 9.1.2.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD intra-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.2.2.5-3. The mapping of measured quantity is defined in Table 9.1.2.2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.2.2.5-1: Void

Table 9.1.2.2.5-2: RSRP TDD Intra frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink/downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0	0	0
N_{oc} Note3	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-106.0	-106.0	-88.0	-88.0	-116.0	
$\hat{E}_s/I_{ot}$		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-100.0	-104.0	-82.0	-86.0	-113.0	-116.0
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-70.05	-70.05	-52.05	-52.05	-82.20	
$\hat{E}_s/N_{oc}$		dB	6.0	2.0	6.0	2.0	3.0	0.0
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.2.2.5-3: RSRP TDD Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 9	RSRP_x - 9	RSRP_x - 8
Highest reported value (Cell 2)	RSRP_x + 1	RSRP_x + 1	RSRP_x + 2
RSRP_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3 FDD Inter frequency RSRP Accuracy

9.1.3.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy

9.1.3.1.1 Test purpose

To verify that the FDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.1.3.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.1.3.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40RSRP|dBm≥ -126 dBm for Bands 9, 41

RSRP|dBm≥ -125 dBm for Bands 2, 5, 7, 17

RSRP|dBm≥ -124 dBm for Bands 3, 8, 12, 13, 14, 20

Table 9.1.3.1.3-1: RSRP FDD Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14, 20	Bands 9, 41
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6	±9	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -70dBm/ $BW_{Channel}$	-118dBm/15kHz … -70dBm/ $BW_{Channel}$	-120dBm/15kHz … -70dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8	±11	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1, clause 9.1.4 and A.9.1.3.

9.1.3.1.4 Test description

9.1.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.3.1.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.1.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.3.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check RSRP reported value in MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP according to Table 9.1.3.1.5-3.
7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.3.1.5-2 as appropriate.

9.1.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.1.4.3-1: Common Exception messages for RSRP FDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.1.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.1.5 Test requirement

Table 9.1.3.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.3.1.5-3.

Table 9.1.3.1.5-1: Void

Table 9.1.3.1.5-2: RSRP FDD - FDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-88.95	-88.95	-109.00	-116.00
	Bands 2, 5, 7, and 17				-107.00	-114.00
	Bands 3, 8, 12, 13, 14 and 20				-106.00	-113.00
	Band 9				-108.00	-115.00
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	14.00	-5.00
RSRP Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-78.95	-78.95	-95.00	-121.00
	Bands 2, 5, 7 and 17				-93.00	-119.00
	Bands 3, 8, 12, 13, 14 and 20				-92.00	-118.00
	Band 9				-94.00	-120.00
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-50.75	-50.75	-67.05	-87.03
	Bands 2, 5, 7, 11, 17				-65.05	-85.03
	Bands 3, 8, 12, 13, 14 and 20				-64.05	-84.03
	Band 9				-66.05	-86.03
$\hat{E}_s/N_{oc}$		dB	10.00	10.00	14.00	-5.00
Propagation condition		-	AWGN		AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.3.1.5-3: RSRP FDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2			
	All bands	Bands 1, 4, 6, 10, 11 18, 19, 21	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14	Band 9
Normal Conditions					
Lowest reported value (Cell 2)	RSRP_52	RSRP_12	RSRP_14	RSRP_15	RSRP_13
Highest reported value (Cell 2)	RSRP_71	RSRP_27	RSRP_29	RSRP_30	RSRP_28
Extreme Conditions					
Lowest reported value (Cell 2)	RSRP_49	RSRP_09	RSRP_11	RSRP_12	RSRP_10
Highest reported value (Cell 2)	RSRP_74	RSRP_30	RSRP_32	RSRP_33	RSRP_31

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP

9.1.3.2.1 Test purpose

To verify that the FDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.1.3.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in table 9.1.3.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1|_{dBm} \geq -127$ dBm if RSRP1 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39 and 40,

$RSRP1|_{dBm} \geq -126$ dBm if RSRP1 is on Band 9,

$RSRP1|_{dBm} \geq -125$ dBm if RSRP1 is on Bands 2, 5, 7, 17,

$RSRP1|_{dBm} \geq -124$ dBm if RSRP1 is on Bands 3, 8, 12, 13, 14, 20

$RSRP2|_{dBm} \geq -127$ dBm if RSRP2 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39 and 40,

$RSRP2|_{dBm} \geq -126$ dBm if RSRP2 is on Band 9,

$RSRP2|_{dBm} \geq -125$ dBm if RSRP2 is on Bands 2, 5, 7, 17,

$RSRP2|_{dBm} \geq -124$ dBm if RSRP2 is on Bands 3, 8, 12, 13, 14, 20

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.3.2.3-1: RSRP FDD Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRP is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	RSRP is on Bands 2, 5, 7, 17	RSRP is on Bands 3, 8, 12, 13, 14, 20	RSRP is on Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot > -6dB	dBm	±6	±6	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 9.1.1.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.3.

9.1.3.2.4 Test description

9.1.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.3.2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.3.2.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.3.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.3.2.5-3.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.3.2.5-2 as appropriate.

9.1.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.1.3.2.4.3-1: Common Exception messages for RSRP FDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.3.2.4.3-2: *MeasResults*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.3.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP FDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
}			

9.1.3.2.5 Test requirement

Table 9.1.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP FDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.3.2.5-3.

Table 9.1.3.2.5-1: Void

Table 9.1.3.2.5-2: RSRP FDD - FDD Inter frequency relative accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	**Cell 2**	**Cell 1**	**Cell 2**
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Measurement gap configuration			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB						
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote1						
OCNG_RBNote						
N_{oc} Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-88. 95	-88. 95	-110.1	-116
	Bands 2, 5, 7, and, 17				-108.1	-114
	Bands 3, 8, 12, 13, 14 and 20				-107.1	-113
	Band 9				-109.1	-115
$\hat{E}_s/I_{ot}$		dB	10	10	14	-5
RSRP Note3	Bands 1, 4, 6,10, 11, 18, 19 and 21	dBm/15 kHz	-78. 95	-78. 95	-96.10	-121
	Bands 2, 5, 7 and 17				-94.10	-119
	Bands 3, 8, 12, 13, 14 and 20				-93.10	-118
	Band 9				-95.10	-120
Io Note3	Bands 1, 4, 6,10, 18, 19 and 21	dBm/9 MHz	-50.75	-50.75	-68.15	-87.03
	Bands 2, 5 and 7, 17				-66.15	-85.03
	Bands 3, 8, 12, 13, 14 and 20				-65.15	-84.03
	Band 9				-67.15	-86.03
$\hat{E}_s/N_{oc}$		dB	10	10	14	-5
Propagation condition		-	AWGN		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 4: RSRP minimum requirements are specified assuming independent interference and						

noise at each receiver antenna port.

Table 9.1.3.2.5-3: RSRP FDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 8)	RSRP_(x - 33)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x -18)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 8)	RSRP_(x - 33)
Highest reported value (Cell 2)	RSRP_(x + 8-)	RSRP_(x 18)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4 TDD Inter frequency RSRP Accuracy

9.1.4.1 TDD - TDD Inter Frequency Absolute RSRP Accuracy

9.1.4.1.1 Test purpose

To verify that the TDD inter-frequency absolute RSRP measurement accuracy is within the specified limit for all bands.

9.1.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.1.4.1.3 Minimum conformance requirements

The absolute accuracy of RSRP is defined as the RSRP measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.4.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

RSRP|dBm≥ -126 dBm for Bands 9, 41,

RSRP|dBm≥ -125 dBm for Bands 2, 5, 7

RSRP|dBm≥ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20

Table 9.1.4.1.3-1: RSRP TDD-TDD Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6	±9	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -70dBm/ $BW_{Channel}$	-118dBm/15kHz … -70dBm/ $BW_{Channel}$	-120dBm/15kHz … -70dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8	±11	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.1 , clause 9.1.4 and A.9.1.4.

9.1.4.1.4 Test description

9.1.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.4.1.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.1.4.2 Test procedure

1. Ensure that the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.4.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the reported RSRP value in MeasurementReport messages. The RSRP value of Cell 2 reported by the UE is compared to the actual RSRP value according to Table 9.1.4.1.5-3.
7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.1.4.1.5-2 as appropriate.

9.1.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.1.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.1.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.1.5 Test requirement

Table 9.1.4.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency absolute accuracy test shall meet the reported values test requirements in table 9.1.4.1.5-3.

Table 9.1.4.1.5-1: Void

Table 9.1.4.1.5-2: RSRP TDD-TDD Inter frequency absolute accuracy test parameters

Parameter		Unit	Test 1		Test 2	
			Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2
$BW_{channel}$		MHz	10	10	10	10
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Gap Pattern Id			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2			R.6 TDD		R.6 TDD	
OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA[Note2] OCNG_RB[Note2]		dB	0	0	0	0
N_{oc} [Note3]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-88.95	-88.95	-109.00	-116.00
$\hat{E}_s/I_{ot}$		dB	10.00	10.00	14.00	-5.00
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40.	dBm/15 kHz	-78.95	-78.95	-95.00	-121.00
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50.75	-50.75	-67.05	-87.03
$\hat{E}_s/N_{oc}$		dB	10.00	10.00	14.00	-5.00
Propagation condition		-	AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.1.4.1.5-3: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_52	RSRP_12
Highest reported value (Cell 2)	RSRP_71	RSRP_27
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_49	RSRP_09
Highest reported value (Cell 2)	RSRP_74	RSRP_30

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.1.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRP

9.1.4.2.1 Test purpose

To verify that the TDD inter-frequency relative accuracy measurement of RSRP is within the specified limit for all bands.

9.1.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.1.4.2.3 Minimum conformance requirements

The relative accuracy of RSRP in inter frequency case is defined as the RSRP measured from one cell compared to the RSRP measured from another cell on a different frequency.

The accuracy requirements in Table 9.1.4.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

$RSRP1|_{dBm} \geq$ -127 dBm if RSRP1 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

$RSRP1|_{dBm} \geq$ -126 dBm if RSRP1 is on Band 9, 41,

$RSRP1|_{dBm} \geq$ -125 dBm if RSRP1 is on Bands 2, 5, 7, 17,

$RSRP1|_{dBm} \geq$ -124 dBm if RSRP1 is on Bands 3, 8, 12, 13, 14, 20

$RSRP2|_{dBm} \geq$ -127 dBm if RSRP2 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40

$RSRP2|_{dBm} \geq$ -126 dBm if RSRP2 is on Band 9, 41,

$RSRP2|_{dBm} \geq$ -125 dBm if RSRP2 is on Bands 2, 5, 7

$RSRP2|_{dBm} \geq$ -124 dBm if RSRP2 is on Bands 3, 8, 12, 13, 14, 17, 20

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| Channel 1_Io -Channel 2_Io | ≤ 20 dB

Table 9.1.4.2.3-1: RSRP TDD-TDD Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRP is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	RSRP is on Bands 2, 5, 7	RSRP is on Bands 3, 8, 12, 13, 14, 17, 20	RSRP is on Band 9, 41
				Io	Io	Io	Io
RSRP for Ês/Iot > -6dB	dBm	±6	±6	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.							

The reporting range of RSRP is defined from -140 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table9.1.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.3.2, clause 9.1.4 and A.9.1.4.

9.1.4.2.4 Test description

9.1.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.1.4.2.4.3.
4. Cell 1 and Cell 2 are on the different carrier frequencies. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.1.4.2.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.1.4.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on cell.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the reported RSRP value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRP value for Cell 2 is compared to the reported RSRP value for Cell 1 for each MeasurementReport message according to Table 9.1.4.2.5-3.
7. SS shall check the MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.1.4.2.5-2 as appropriate.

9.1.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.1.4.2.4.3-1: Common Exception messages for RSRP TDD - TDD Inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-3

Table 9.1.4.2.4.3-2: *MeasResults*: Additional RSRP TDD - TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.1.4.2.4.3-3: *MeasResultListEUTRA*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId	INTEGER (0..503)	
measResult SEQUENCE {			
rsrpResult		According to specific test	
rsrqResult	Not present		
}			
}			

9.1.4.2.5 Test requirement

Table 9.1.4.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRP TDD inter-frequency relative accuracy test shall meet the reported values test requirements in table 9.1.4.2.5-3. The mapping of measured quantity is defined in Table 9.1.4.2.5-3. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4.2.5-1: Void

Table 9.1.4.2.5-2: RSRP TDD-TDD Inter frequency relative accuracy test parameters

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Test 1</th><th colspan="2">Test 2</th></tr>
<tr><th>Cell 1</th><th>Cell 2</th><th>Cell 1</th><th>Cell 2</th></tr>
<tr><td colspan="2">E-UTRA RF Channel Number</td><td></td><td>1</td><td>2</td><td>1</td><td>2</td></tr>
<tr><td colspan="2">$BW_{channel}$</td><td>MHz</td><td>10</td><td>10</td><td>10</td><td>10</td></tr>
<tr><td colspan="2">Special subframe configuration[Note1]</td><td></td><td colspan="2">6</td><td colspan="2">6</td></tr>
<tr><td colspan="2">Uplink-downlink configuration[Note1]</td><td></td><td colspan="2">1</td><td colspan="2">1</td></tr>
<tr><td colspan="2">Gap Pattern Id</td><td></td><td>0</td><td>-</td><td>0</td><td>-</td></tr>
<tr><td colspan="2">Measurement bandwidth</td><td>n_{PRB}</td><td colspan="2">22—27</td><td colspan="2">22—27</td></tr>
<tr><td colspan="2">PDSCH Reference measurement channel defined inA.1.2</td><td></td><td>R.0 TDD</td><td>-</td><td>R.0 TDD</td><td>-</td></tr>
<tr><td colspan="2">PDSCH allocation</td><td>n_{PRB}</td><td>13—36</td><td>-</td><td>13—36</td><td>-</td></tr>
<tr><td colspan="2">PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.2</td><td></td><td colspan="2">R.6 TDD</td><td colspan="2">R.6 TDD</td></tr>
<tr><td colspan="2">OCNG Patterns defined in D.2.1 (OP.1 TDD) and D.2.2 (OP.2 TDD)</td><td></td><td>OP.1 TDD</td><td>OP.2 TDD</td><td>OP.1 TDD</td><td>OP.2 TDD</td></tr>
<tr><td colspan="2">PBCH_RA</td><td rowspan="13">dB</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td><td rowspan="13">0</td></tr>
<tr><td colspan="2">PBCH_RB</td></tr>
<tr><td colspan="2">PSS_RA</td></tr>
<tr><td colspan="2">SSS_RA</td></tr>
<tr><td colspan="2">PCFICH_RB</td></tr>
<tr><td colspan="2">PHICH_RA</td></tr>
<tr><td colspan="2">PHICH_RB</td></tr>
<tr><td colspan="2">PDCCH_RA</td></tr>
<tr><td colspan="2">PDCCH_RB</td></tr>
<tr><td colspan="2">PDSCH_RA</td></tr>
<tr><td colspan="2">PDSCH_RB</td></tr>
<tr><td colspan="2">OCNG_RA[Note2]</td></tr>
<tr><td colspan="2">OCNG_RB[Note2]</td></tr>
<tr><td>N_{oc} Note3</td><td>Bands 33, 34, 35, 36, 37, 38, 39 and 40</td><td>dBm/15 kHz</td><td>-88. 95</td><td>-88. 95</td><td>-110.1</td><td>-116</td></tr>
<tr><td colspan="2">$\hat{E}_s / I_{ot}$</td><td>dB</td><td>10</td><td>10</td><td>14</td><td>-5</td></tr>
<tr><td>RSRP[Note4]</td><td>Bands 33, 34, 35, 36, 37, 38, 39 and 40.</td><td>dBm/15 kHz</td><td>-78.95</td><td>-78.95</td><td>-96.10</td><td>-121</td></tr>
<tr><td>Io[Note4]</td><td>Bands 33, 34, 35, 36, 37, 38, 39 and 40</td><td>dBm/9 MHz</td><td>-50. 75</td><td>-50.75</td><td>-68.15</td><td>-87.03</td></tr>
<tr><td colspan="2">$\hat{E}_s / N_{oc}$</td><td>dB</td><td>10</td><td>10</td><td>14</td><td>-5</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td colspan="2">AWGN</td><td colspan="2">AWGN</td></tr>
<tr><td colspan="7">Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.</td></tr>
</table>

Table 9.1.4.2.5-3: RSRP TDD-TDD Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 8)	RSRP_(x - 33)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x - 18)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - 8)	RSRP_(x - 33)
Highest reported value (Cell 2)	RSRP_(x + 8)	RSRP_(x - 18)
RSRP_x is the reported value of Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2 RSRQ

9.2.1 FDD Intra frequency RSRQ Accuracy

9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy

9.2.1.1.1 Test purpose

To verify that the FDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.1.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.2.1.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.1.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40RSRP|dBm≥ -126 dBm for Bands 9, 41

$RSRP|_{dBm}\geq$ -125 dBm for Bands 2, 5, 7, 17

$RSRP|_{dBm}\geq$ -124 dBm for Bands 3, 8, 12, 13, 14, 20

Table 9.2.1.1.3-1: RSRQ FDD intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14, 20	Bands 9, 41
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRQ when RSRP Ês/Iot ≥ -6 dB	dBm	± 3.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.1.1.3-2.

Table 9.2.1.1.3-2: RSRQ FDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1 and A.9.2.1.

9.2.1.1.4 Test description

9.2.1.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.1.1.4.3.

4. There is one E-UTRA FDD carrier and two cells specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.1.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to Table 9.2.1.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check the RSRQ value in MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.1.1.5-3.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.2.1.1.5-2 as appropriate.

9.2.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.1.1.4.3-1: Common Exception messages for RSRQ FDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3. 1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.1.1.4.3-2: *MeasResults*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.1.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.1.1.5 Test requirement

Table 9.2.1.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.1.1.5-3.

Table 9.2.1.1.5-1: Void

Table 9.2.1.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA Note1								
OCNG_RB Note1								
N_{oc} Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-85.51	-85.51	-103.85	-103.85	-116	
	Bands 2, 5, 7 and 17						-114	
	Bands 3, 8, 12, 13, 14 and 20						-113	
	Band 9						-115	
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.17	-5.17
RSRP Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
	Bands 2, 5,7 and 17						-117.60	-117.60
	Bands 3, 8, 12, 13, 14 and 20						-116.60	-116.60
	Band 9						-118.60	-118.60
RSRQ Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dB	-14.77	-14.77	-16.76	-16.76	-17. 12	-17. 12
	Bands 2, 5, 7 and 17							
	Bands 3, 8, 12, 13, 14 and 20							
	Band 9							
Io Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/9 MHz	-50.75	-50.75	-73	-73	-85. 49	
	Bands 2, 5, 7 and 17						49-83.	
	Bands 3, 8, 12, 13, 14 and 20						-82. 49	
	Band 9						-84. 49	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.1.1.5-3: RSRQ FDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3			
	All bands	All bands	Bands 1, 4, 6, 10, 18, 19, 21	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14	Band 9
Normal Conditions						
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14	RSRQ_14	RSRQ_14	RSRQ_14
Extreme Conditions						
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00	RSRQ_00	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15	RSRQ_15	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.2 TDD Intra frequency RSRQ Accuracy

9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy

9.2.2.1.1 Test purpose

To verify that the TDD intra frequency absolute RSRQ measurement accuracy is within the specified limit for all TDD bands.

9.2.2.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.2.2.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell.

The accuracy requirements in table 9.2.2.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40RSRP|dBm≥ -126 dBm for Bands 9, 41

$RSRP|_{dBm}$≥ -125 dBm for Bands 2, 5, 7

$RSRP|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20

Table 9.2.2.1.3-1: RSRQ TDD intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRQ when RSRP Ês/Iot ≥ -6 dB	dBm	± 3.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution.

The mapping of measured quantity is defined in Table 9.2.2.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.2.2.1.3-2: RSRQ TDD Intra frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.5.1, 9.1.7 and A.9.2.2.

9.2.2.1.4 Test description

9.2.2.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.20.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.2.1.4.3.

4. There is one E-UTRA TDD carrier and two cells specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.2.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell on the same frequency as that of the serving cell, Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.2.2.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the RSRQ value in MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ according to Table 9.2.2.1.5-3.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.2.2.1.5-2 as appropriate.

9.2.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.2.1.4.3-1: Common Exception messages for RSRQ TDD intra frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.2.1.4.3-2: *MeasResults*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
meaResuCellltsServCell SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.2.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
measResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId of Cell 2		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.2.1.5 Test requirement

Table 9.2.2.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD intra frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.2.1.5-3.

Table 9.2.2.1.5-1: Void

Table 9.2.2.1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD intra frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
$BW_{channel}$		MHz	10		10		10	
Special subframe configuration[Note1]			6		6		6	
Uplink-downlink configuration[Note1]			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note2]								
OCNG_RB[Note2]								
N_{oc} [Note3]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-85.51	-85.51	-103.85	-103.85	-116	
$\hat{E}_s/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5. 17	-5. 17
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-82.51	-82.51	-106.75	-106.75	-119.60	-119.60
RSRQ[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.77	-14.77	-16.76	-16.76	-17. 12	-17. 12
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50.75	-50.75	-73	-73	-85.49	
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-3.6	-3.6
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.2.1.5-3: RSRQ TDD Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	Bands 33, 34, 35, 36, 37, 38, 39 and 40
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3 FDD - FDD Inter frequency RSRQ Accuracy

9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy

9.2.3.1.1 Test purpose

To verify that the FDD - FDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.2.3.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.3.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40

RSRP|dBm≥ -126 dBm for Bands 9, 41,

$RSRP|_{dBm}\geq$ -125 dBm for Bands 2, 5, 7, 17

$RSRP|_{dBm}\geq$ -124 dBm for Bands 3, 8, 12, 13, 14, 20

Table 9.2.3.1.3-1: RSRQ FDD - FDD inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 17	Bands 3, 8, 12, 13, 14, 20	Bands 9, 41
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRQ when RSRP Ês/Iot ≥ -6 dB	dBm	± 3.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.1.3-2.

Table 9.2.3.1.3-2: RSRQ FDD - FDD Inter frequency absolute accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.3.

9.2.3.1.4 Test description

9.2.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.3.1.4.3.

4. There are two E-UTRA FDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to Table 9.2.3.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the RSRQ value in MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.3.1.5-3.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to table G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each test interval in Table 9.2.3.1.5-2 as appropriate.

9.2.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.3.1.4.3-1: Common Exception messages for RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3. 1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.1.4.3-2: *MeasResults*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.3.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysCellId		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.3.1.5 Test requirement

Table 9.2.3.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.3. 1.5-3.

Table 9.2.3.1.5-1: Void

Table 9.2.3.1.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Measurement gap configuration			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note1 OCNG_RB Note1		dB	0	0	0	0	0	0
N_{oc} Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-80	-80.8	-104	-104	-119	-119
	Bands 2, 5,7 and 17						-117	-117
	Bands 3, 8, 12, 13, 14 and 20						-116	-116
	Band 9						-118	-118
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
RSRP Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70	-123.50	-123.50
	Bands 2, 5, 7 and 17						-121.50	-121.50
	Bands 3, 8, 12, 13, 14 and 20						-120.50	-120.50
	Band 9						-122.50	-122.50
RSRQ Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dB	-14.76	-14.76	-16.76	-16.76	-16.61	-16.61
	Bands 2, 5, 7 and 17							
	Bands 3, 8, 12, 13, 14 and 20							
	Band 9							
Io Note3	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/9 MHz	-50	-50.8	-74.95	-74.95	-89.90	-89.90
	Bands 2, 5, 7 and 17						-87.90	-87.90
	Bands 3, 8, 12, 13, 14 and 20						-86.90	-86.90
	Band 9						-88.90	-88.90
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.3.1.5-3: RSRQ FDD - FDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRQ

9.2.3.2.1 Test purpose

To verify that the FDD - FDD inter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.3.2.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 8 and forward.

9.2.3.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.3.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1|_{dBm} \geq$ -127 dBm if RSRP1 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40

$RSRP1|_{dBm} \geq$ -126 dBm if RSRP1 is on Band 9, 41

$RSRP1|_{dBm} \geq$ -125 dBm if RSRP1 is on Bands 2, 5, 7, 17,

$RSRP1|_{dBm} \geq$ -124 dBm if RSRP1 is on Bands 3, 8, 12, 13, 14, 20

$RSRP2|_{dBm} \geq$ -127 dBm if RSRP2 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40

$RSRP2|_{dBm} \geq$ -126 dBm if RSRP2 is on Band 9, 41

$RSRP2|_{dBm} \geq$ -125 dBm if RSRP2 is on Bands 2, 5, 7, 17,

$RSRP2|_{dBm} \geq$ -124 dBm if RSRP2 is on Bands 3, 8, 12, 13, 14, 20.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \le [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ [20] dB

Table 9.2.3.2.3-1: RSRQ FDD - FDD inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	RSRQ is on Bands 2, 5, 7, 17	RSRQ is on Bands 3, 8, 12, 13, 14, 20	RSRQ is on Bands 9, 41
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 3	± 4	-121dBm/15kHz … -50dBm	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRQ when RSRP Ês/Iot ≥ -6 dB	dBm	± 4	± 4	-121dBm/15kHz … -50dBm	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells to which the requirement applies.							

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.3.2.3-2.

Table 9.2.3.2.3-2: RSRQ FDD - FDD Inter frequency relative accuracy measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
…	…	…
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.3.

9.2.3.2.4 Test description

9.2.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.1.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.3.2.4.3.
4. There are two E-UTRA FDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.0 and C.1 for this test.

9.2.3.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.2.3.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the RSRQ value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each test interval in Table 9.2.3.2.5-2 as appropriate.

9.2.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.3.2.4.3-1: Common Exception messages for RSRQ FDD - FDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3. 1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.2.4.3-2: *MeasResults*: Additional RSRQ FDD - FDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServCell SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific tes	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.3.2.4.3-3: *MeasResultListEUTRA*: Additional RSRQ FDD - FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.3.2.5 Test requirement

Table 9.2.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ FDD - FDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.3.2.5-3.

Table 9.2.3.2.5-1: Void

Table 9.2.3.2.5-2: Cell Specific Test requirement Parameters for RSRQ FDD - FDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in D.1.1 (OP.1 FDD) and D.1.2 (OP.2 FDD)			OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA		dB	0	0	0	0	0	0
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA[Note1]								
OCNG_RB[Note1]								
N_{oc} [Note2]	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-80.8	-80.8	-104	-104	-119	-119
	Bands 2, 5, 7 and 17						-117	-117
	Bands 3, 8, 12, 13, 14 and 20						-116	-116
	Band 9						-118	-118
$\hat{E}_s/I_{ot}$		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
RSRP[Note3]	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz	-825.5	-82.55	-108.70	-108.70	-123.50	-123.50
	Bands 2, 5, 7 and 17						-121.50	-121.50
	Bands 3, 8, 12, 13, 14 and 20						-120.50	-120.50
	Band 9						-122.50	-122.50
RSRQ[Note3]	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dB	-14.76	-14.76	-16.76	-16.76	-16.61	-16.6
	Bands 2, 5, 7 and 17							
	Bands 3, 8, 12, 13, 14 and 20							
	Band 9							
Io[Note3]	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/9 MHz	-50.8	-50.8	-74.95	-74.95	-89.90	-89.90
	Bands 2, 5, 7 and 17						-87.90	-87.90
	Bands 3, 8, 12, 13, 14 and 20						-86.90	-86.90
	Band 9						-88.90	-88.90
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3:	RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.3.2.5-3: RSRQ FDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x - 10	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x +8	RSRQ_x +10	RSRQ_x +10
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 10	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 10	RSRQ_x + 10
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4 TDD - TDD Inter frequency RSRQ Accuracy

9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy

9.2.4.1.1 Test purpose

To verify that the TDD - TDD inter frequency absolute RSRQ measurement accuracy is within the specified limit for all bands.

9.2.4.1.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.2.4.1.3 Minimum conformance requirements

The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell.

The accuracy requirements in table 9.2.4.1.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two orRSRQ value of Cell 2 reported by the UE four antenna ports.

Conditions defined in TS 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

RSRP|dBm≥ -126 dBm for Bands 9, 41,

$RSRP|_{dBm} \geq$ -125 dBm for Bands 2, 5, 7

$RSRP|_{dBm} \geq$ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20

Table 9.2.3.1.3-1: RSRQ TDD - TDD inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRQ when RSRP Ês/Iot ≥ -6 dB	dBm	± 3.5	± 4	-121dBm/15kHz … -50dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.2.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.1 and A.9.2.4.

9.2.4.1.4 Test description

9.2.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.2.4.1.4.3.

4. There are two E-UTRA TDD carriers and one cell on each carrier specified in each test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.1.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The absolute accuracy of RSRQ is defined as the RSRQ measured from a cell that has different carrier frequency from the serving cell, Cell 1. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to Table 9.2.4.1.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check the RSRQ value in MeasurementReport messages. The RSRQ value of Cell 2 reported by the UE is compared to the actual RSRQ value according to Table 9.2.4.1.5-3.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.1.5-2 as appropriate.

9.2.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.1.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.1.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell	SEQUENCE {		
rsrpResult		Not present	
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.1.5 Test requirement

Table 9.2.4.1.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency absolute accuracy test shall meet the reported values test requirements in Table 9.2.4.2.5-3.

Table 9.2.4.1.5-1: Void

Table 9.2.4.1.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency absolute accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-80	-80.8	-104	-104	-119	-119
Ês/Iot		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
RSRP Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70	-123.50	-123.50
RSRQ Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.7	-14.76	-16.76	-16.76	-16.61	-16.61
Io Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50	-50. 8	-74.95	-74.95	-89.90	-89.90
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4.1.5-3: RSRQ TDD - TDD inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_04	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_16	RSRQ_14	RSRQ_14
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_01	RSRQ_00	RSRQ_00
Highest reported value (Cell 2)	RSRQ_19	RSRQ_15	RSRQ_15

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.2.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRQ

9.2.4.2.1 Test purpose

To verify that the TDD - TDDinter frequency relative accuracy measurement of RSRQ is within the specified limit for all bands.

9.2.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 8 and forward.

9.2.4.2.3 Minimum conformance requirements

The relative accuracy of RSRQ in inter frequency case is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency.

The accuracy requirements in table 9.2.4.2.3-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [2] clause 7.3 for reference sensitivity are fulfilled.

$RSRP1|_{dBm} \geq -127$ dBm if RSRP1 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

$RSRP1|_{dBm} \geq -126$ dBm if RSRP1 is on Band 9, 41,

$RSRP1|_{dBm} \geq -125$ dBm if RSRP1 is on Bands 2, 5, 7

$RSRP1|_{dBm} \geq -124$ dBm if RSRP1 is on Bands 3, 8, 12, 13, 14, 17, 20

$RSRP2|_{dBm} \geq -127$ dBm if RSRP2 is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43$RSRP2|_{dBm} \geq -126$ dBm if RSRP2 is on Band 9, 41,

$RSRP2|_{dBm} \geq -125$ dBm if RSRP2 is on Bands 2, 5, 7

$RSRP2|_{dBm} \geq -124$ dBm if RSRP2 is on Bands 3, 8, 12, 13, 14, 17, 20

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ [20] dB

Table 9.2.4.2.3-1: RSRQ TDD - TDD Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	RSRQ is on Bands 2, 5, 7	RSRQ is on Bands 3, 8, 12, 13, 14, 17, 20	RSRQ is on Bands 9, 41
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 3	± 4	-121dBm/15kHz … -50dBm	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRQ when RSRP Ês/Iot ≥ -6 dB	dBm	± 4	± 4	-121dBm/15kHz … -50dBm	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2. The parameter Ês/Iot is the minimum Ês/Iot of the pair of cells.to which the requirement applies.							

The reporting range of RSRQ is defined from -19.5 dB to -3 with 0.5 dB resolution. The mapping of measured quantity is defined in Table 9.2.2.1.3-2.

The normative reference for this requirement is TS 36.133 [4] clause 9.1.6.2 and A.9.2.4.

9.2.4.2.4 Test description

9.2.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. Propagation conditions are set according to Annex B clause B.0.
3. Message contents are defined in clause 9.2.4.2.4.3.
4. There are two E-UTRA TDD carriers and one cell on each carrier specified in the test. Cell 1 is the cell used for call setup with the power level set according to clause C.0 and C.1 for this test.

9.2.4.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell. The relative accuracy of RSRQ is defined as the RSRQ measured from one cell compared to the RSRQ measured from another cell on a different frequency. The Gap pattern configuration is with id#0 as defined in TS 36.133 clause 8.1.2.1.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.2.4.2.5-2 for the test interval as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check the RSRQ value of Cell 1 and Cell 2 in MeasurementReport messages. The reported RSRQ value for Cell 2 is compared to the reported RSRQ value for Cell 1 for each MeasurementReport message according to Table 9.2.4.2.5-3.

7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each test interval in Table 9.2.4.1.5-2 as appropriate.

9.2.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.2.4.2.4.3-1: Common Exception messages for RSRQ TDD - TDD inter frequency relative accuracy test requirement

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.4.1.4.3-2: *MeasResults*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
}			
}			

Table 9.2.4.1.4.3-3: *MeasResultListEUTRA*: Additional RSRQ TDD - TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId	PhysicalCellIdentity		
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult		Set according to specific test	
}			
}			

9.2.4.2.5 Test requirement

Table 9.2.4.2.5-2 defines the primary level settings including test tolerances for all tests.

Each RSRQ TDD inter frequency relative accuracy test shall meet the reported values test requirements in Table 9.2.4.2.5-3.

Table 9.2.4.2.5-1: Void

Table 9.2.4.2.5-2: Cell Specific Test requirement Parameters for RSRQ TDD - TDD inter frequency relative accuracy

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1	2	1	2	1	2
$BW_{channel}$		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subframe configuration Note1			6		6		6	
Uplink-downlink configuration Note1			1		1		1	
Measurement bandwidth		n_{PRB}	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA Note2 OCNG_RB Note2		dB	0	0	0	0	0	0
N_{oc} Note3	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-80.8	-80.8	-104	-104	-119	-119
Ês/Iot		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
RSRP Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-82. 55	-82. 55	-108.70	-108.70	-123.50	-123.50
RSRQ Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.76	-14.76	-16.76	-16.76	-16.61	-16.61
Io Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50.8	-50.8	-74.95	-74.95	-89.90	-89.90
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.7	-4.7	-4.5	-4.5
Propagation condition		-	AWGN		AWGN		AWGN	

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 9.2.4.2.5-3: RSRQ TDD - TDD inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 8	RSRQ_x -10	RSRQ_x -10
Highest reported value (Cell 2)	RSRQ_x + 8	RSRQ_x + 10	RSRQ_x + 10
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_x - 10	RSRQ_x - 10	RSRQ_x - 10
Highest reported value (Cell 2)	RSRQ_x + 10	RSRQ_x + 10	RSRQ_x + 10
RSRQ_x is the reported value of Cell 1			

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

9.3 UTRA FDD CPICH RSCP

9.3.1 E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties and test tolerances applicable to this test are undefined*
- *Statistical testing of cell re-selection delay performance requirements are undefined*

9.3.1.1 Test purpose

To verify that the CPICH RSCP absolute measurement accuracy is within the specified limits.

9.3.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

9.3.1.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH RSCP.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.3.1.3-1.

Table 9.3.1.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions			
		Normal condition	Extreme condition	Band I, IV, VI, X XI, XIX and XXI	Band II, V and VII	Band III, VIII, XII, XIII and XIV	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70	-92…-70	-91…-70	-93...-70
	dBm	± 8	± 11	-70...-50	-70…-50	-70…-50	-70...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.1.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV _-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV _-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.1.2 and 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.1.

9.3.1.4 Test description

9.3.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 9.3.1.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 9.3.1.4.3.
5. Cell 1 is the serving E-UTRAN FDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.1.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.3.1.4.2 Test procedure

1. Ensure the UE is in State 3A according to TS 36.508 [7] clause 4.5.3A.
2. Set the parameters according to Table 9.3.1.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check CPICH_RSCP reported values of Cell 2 in MeasurementReport messages according to Table 9.3.1.5-3.
7. Repeat step 1-6 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.3.1.5-1 as appropriate.

9.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6 with the following exceptions:

Table 9.3.1.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig SEQUENCE {			
quantityConfigUTRA SEQUENCE {			
measQuantityUTRA-FDD	cpich-RSCP		UTRAN
}			
}			
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.3.1.4.3-2: *MeasResults*: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.3.1.4.3-3: MeasResultListUTRA: Additional E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
measResult SEQUENCE {			
utra-RSCP	Set according to specific test INTEGER (-5..91)		
}			
}			

9.3.1.5 Test requirement

The test parameters are given in Tables 9.3.1.4.1-1, 9.3.1.5-1 and 9.3.1.5-2 as below. Table 9.3.1.5-2 and 9.3.1.5-3 define the primary level settings including test tolerances for all tests.

Table 9.3.1.5-1: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD	

PBCH_RA	dB	0
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA Note 1	dB	
OCNG_RB Note 1	dB	
N_{oc} Note 2	dBm/15 kHz	-98 + TT
RSRP Note 3	dBm/15 kHz	-94 + TT
$\hat{E}_s/I_{ot}$	dB	4 + TT
SCH_RP Note 3	dBm/15 kHz	-94 + TT
$\hat{E}_s/N_{oc}$	dB	4 + TT
Propagation Condition		AWGN

Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.3.1.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th>Test 1</th><th>Test 2</th></tr>
<tr><th>Cell 2</th><th>Cell 2</th></tr>
<tr><td colspan="2">CPICH_Ec/Ior</td><td>dB</td><td>-10</td><td>-10</td></tr>
<tr><td colspan="2">PCCPCH_Ec/Ior</td><td>dB</td><td>-12</td><td>-12</td></tr>
<tr><td colspan="2">SCH_Ec/Ior</td><td>dB</td><td>-12</td><td>-12</td></tr>
<tr><td colspan="2">PICH_Ec/Ior</td><td>dB</td><td>-15</td><td>-15</td></tr>
<tr><td colspan="2">DPCH_Ec/Ior</td><td>dB</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">OCNS_Ec/Ior</td><td>dB</td><td>-0.94</td><td>-0.94</td></tr>
<tr><td rowspan="4">Ioc</td><td>Band I, IV, VI, X, XI, XIX, XXI</td><td rowspan="4">dBm/3.84 MHz</td><td rowspan="4">-60.00</td><td>-94.46 + TT</td></tr>
<tr><td>Band II, V, VII</td><td>-92.46 + TT</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV</td><td>-91.46 + TT</td></tr>
<tr><td>Band IX (Note 2)</td><td>-93.46 + TT</td></tr>
<tr><td colspan="2">Îor/Ioc</td><td>dB</td><td>9.54</td><td>-9.54 + TT</td></tr>
<tr><td rowspan="4">CPICH RSCP, Note 1</td><td>Band I, IV, VI, X, XI, XIX, XXI</td><td rowspan="4">dBm</td><td rowspan="4">-60.46</td><td>-114.0 + TT</td></tr>
<tr><td>Band II, V, VII</td><td>-112.0 + TT</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV</td><td>-111.0 + TT</td></tr>
<tr><td>Band IX (Note 2)</td><td>-113.0 + TT</td></tr>
<tr><td rowspan="4">Io, Note 1</td><td>Band I, IV, VI, X, XI, XIX, XXI</td><td rowspan="4">dBm/3.84 MHz</td><td rowspan="4">-50.00</td><td>-94.0 + TT</td></tr>
<tr><td>Band II, V, VII</td><td>-92.0 + TT</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV</td><td>-91.0 + TT</td></tr>
<tr><td>Band IX (Note 2)</td><td>-93.0 + TT</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td>AWGN</td><td>AWGN</td></tr>
<tr><td colspan="5">NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
NOTE 3: Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.</td></tr>
</table>

Each UTRAN FDD CPICH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.3.1.5-3.

Table 9.3.1.5-3: UTRAN FDD CPICH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value	CPICH_RSCP_X	CPICH_RSCP_X
Highest reported value	CPICH_RSCP_X	CPICH_RSCP_X
Extreme Conditions		
Lowest reported value	CPICH_RSCP_X	CPICH_RSCP_X
Highest reported value	CPICH_RSCP_X	CPICH_RSCP_X

9.3.2 E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

9.3.2.1 Test purpose

To verify that the E-UTRAN TDD - UTRA FDD CPICH RSCP absolute measurement accuracy is within the specified limits.

9.3.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

9.3.2.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH RSCP.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.3.2.3-1.

Table 9.3.2.3-1: UTRAN FDD CPICH_RSCP absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions			
		Normal condition	Extreme condition	Band I, IV, VI, X XI, XIX and XXI	Band II, V and VII	Band III, VIII, XII, XIII and XIV	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70	-92…-70	-91…-70	-93...-70
	dBm	± 8	± 11	-70...-50	-70…-50	-70…-50	-70...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP is defined in Table 9.3.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.3.2.3-2: CPICH RSCP measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_RSCP_LEV _-05	CPICH RSCP <-120	dBm
CPICH_RSCP_LEV _-04	-120 ≤ CPICH RSCP < -119	dBm
CPICH_RSCP_LEV _-03	-119 ≤ CPICH RSCP < -118	dBm
…	…	…
CPICH_RSCP_LEV _89	-27 ≤ CPICH RSCP < -26	dBm
CPICH_RSCP_LEV _90	-26 ≤ CPICH RSCP < -25	dBm
CPICH_RSCP_LEV _91	-25 ≤ CPICH RSCP	dBm

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.1.2 and 9.1.1.3 and TS 36.133 [4] clause 9.2.1 and A.9.3.2.

9.3.2.4 Test description

9.3.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. The general test parameter settings are set up according to Table 9.3.2.4.1-1.

3. Propagation conditions are set according to Annex B clause B.0.

4. Message contents are defined in clause 9.3.2.4.3.

5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.3.2.4.1-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.3.2.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.3.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check CPICH_RSCP reported values of Cell 2 in MeasurementReport messages according to Table 9.3.2.5-3.
7. Repeat step 1-6 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.3.2.5-1 as appropriate.

9.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.3.2.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.3.2.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.3.2.4.3-3: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA FDD CPICH RSCP absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
locationAreaCode	LocationAreaCode		
routingAreaCode	RoutingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSCP	According to specific test		
}			
}			

9.3.2.5 Test requirement

The test parameters are given in Tables 9.3.2.4.1-1, 9.3.2.5-1 and 9.3.2.5-2 as below. Table 9.3.2.5-2 and 9.3.2.5-3 define the primary level settings including test tolerances for all tests.

Each UTRAN FDD CPICH RSCP absolute measurement accuracy test shall meet the reported values test requirements in table 9.3.2.5-3.

Table 9.3.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	
$BW_{channel}$	MHz	10	
Special subframe configuration[Note1]		6	
Uplink-downlink configuration[Note1]		1	
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD	
PBCH_RA	dB	0	
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB		
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA[Note 2]	dB		
OCNG_RB[Note 2]	dB		
N_{oc} Note 3	dBm/15 kHz	-98	
RSRP Note 4	dBm/15 kHz	-94	
$\hat{E}_s/I_{ot}$	dB	4	
SCH_RP Note 4	dBm/15 kHz	-94	
$\hat{E}_s/N_{oc}$	dB	4	
Propagation Condition		AWGN	
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211. Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.			

Table 9.3.2.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter		Unit	Test 1	Test 2
			Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12
SCH_Ec/Ior		dB	-12	-12
PICH_Ec/Ior		dB	-15	-15
DPCH_Ec/Ior		dB	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94
Ioc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-60.00+TT	-94.46+TT
	Band II, V, VII			-92.46+TT
	Band III, VIII, XII, XIII, XIV			-91.46+TT
	Band IX (Note 2)			-93.46+TT
Îor/Ioc		dB	9.54+TT	-9.54+TT
CPICH RSCP, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm	-60.46+TT	-114.0+TT
	Band II, V, VII			-112.0+TT
	Band III, VIII, XII, XIII, XIV			-111.0+TT
	Band IX (Note 2)			-113.0+TT
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz	-50.00+TT	-94.0+TT
	Band II, V, VII			-92.0+TT
	Band III, VIII, XII, XIII, XIV			-91.0+TT
	Band IX (Note 2)			-93.0+TT
Propagation condition		-	AWGN	AWGN
NOTE 1: CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves. NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE. Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.				

Table 9.3.2.5-3: UTRAN FDD CPICH RSCP absolute measurement accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value	CPICH_RSCP_x	CPICH_RSCP_x
Highest reported value	CPICH_RSCP_x	CPICH_RSCP_x
Extreme Conditions		
Lowest reported value	CPICH_RSCP_x	CPICH_RSCP_x
Highest reported value	CPICH_RSCP_x	CPICH_RSCP_x

9.4 UTRAN FDD CPICH Ec/No

9.4.1 E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

9.4.1.1 Test purpose

To verify that the E-UTRAN FDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits.

9.4.1.2 Test applicability

This test applies to all types of E-UTRA FDD UE release 9 and forward that support UTRA FDD.

9.4.1.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No

The accuracy requirements in table 9.4.1.3-1 are valid under the following conditions:

CPICH_RSCP1$|_{dBm}$ ≥ -114 dBm for Bands I, IV, VI, X and XI,

CPICH_RSCP1$|_{dBm}$ ≥ -113 dBm for Band IX,

CPICH_RSCP1$|_{dBm}$ ≥ -112 dBm for Bands II, V and VII,

CPICH_RSCP1$|_{dBm}$ ≥ -111 dBm for Band III, XII, XIII and XIV.

$$\left.\frac{I_o}{\left(\hat{I}_{or}\right)}\right|_{in\ dB} - \left.\left(\frac{CPICH\_E_c}{I_{or}}\right)\right|_{in\ dB} \le 20dB$$

Table 9.4.1.3-1: CPICH_Ec/Io E-UTRA FDD Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions			
		Normal condition	Extreme condition	Band I, IV VI, X and XI	Band II, V and VII	Band III, VIII, XII, XIII and XIV	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
CPICH_Ec/Io	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50	-93...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH Ec/No is defined in Table 9.4.1.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.1.3-2: E-UTRA FDD CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [2] clauses 9.1.2.2.2 and TS 36.133 [4] clause 9.2.3 and A.9.4.1.

9.4.1.4 Test description

9.4.1.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to Annex B clause B.0.

3. Message contents are defined in clause 9.4.1.4.3.

4. Cell 1 is the serving cell and Cell 2 is the target cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

9.4.1.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.

2. Set the parameters according to Table 9.4.1.5-2 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.

3. SS shall transmit an RRCConnectionReconfiguration message on cell1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check RSRP reported values of Cell 1 and Cell 2 in MeasurementReport messages according to Table 9.4.1.5-3.

7. SS shall check the MeasurementReport message transmitted by the UE until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.4.1.5-2 as appropriate.

9.4.1.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.4.1.4.3-1: CPICH_Ec/Io measurement measurement configuration

Default Message Contents	
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-7

Table 9.4.1.4.3-2: *MeasConfig- DEFAULT:* CPICH_Ec/Io measurement measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.4.1.4.3-3: *MeasResults*: CPICH_Ec/Io measurement measurement configuration

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.4.1.4.3-4: MeasResultListUTRA: CPICH_Ec/Io measurement measurement configuration

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
locationAreaCode	LocationAreaCode		
routingAreaCode	RoutingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-EcN0	According to specific test		
}			
}			

9.4.1.5 Test requirement

The test parameters are given in Tables 9.4.1.5-2, 9.4.1.5-3 and 9.4.1.5-4 as below. Table, 9.4.1.5-3 and 9.4.1.5-4 define the primary level settings including test tolerances for all tests.

Table 9.4.1.5-1: CPICH_Ec/Io Inter frequency relative accuracy, minimum requirements

Parameter	Unit	Accuracy [dB]		Conditions			
		Normal condition	Extreme condition	Band I, IV, VI, X and XIX	Band IX	Band II, V, VII and XI	Band III, VIII, XII, XIII and XIV
				Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]	Io [dBm/3.84 MHz]
The lower of the CPICH_Ec/Io from cell1 and cell2	dB	± 1.5+TT for -14 ≤ CPICH Ec/Io ± 2 +TT for -16 ≤ CPICH Ec/Io < -14 ± 3 +TT for -20 ≤ CPICH Ec/Io < -16	± 3+TT	-94...-50	-93...-50	-92…-50	-91…-50

Table 9.4.1.5-2: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A. 2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133[4] section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table 9.4.1.5-3: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number		1		
$BW_{channel}$	MHz	10		
OCNG Patterns defined in D.1.1 (OP.1 FDD)		OP.1 FDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA Note 1	dB			
OCNG_RB Note 1	dB			
N_{oc} Note 2	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-94		
$\hat{E}_s/I_{ot}$	dB	4		
SCH_RP Note 3	dBm/15 kHz	-94		
$\hat{E}_s/N_{oc}$	dB	4		
Propagation Condition		AWGN		
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

Table 9.4.1.5-4: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

<table>
<tr><th colspan="2" rowspan="2">Parameter</th><th rowspan="2">Unit</th><th>Test 1</th><th>Test 2</th><th>Test 3</th></tr>
<tr><th>Cell 2</th><th>Cell 2</th><th>Cell 2</th></tr>
<tr><td colspan="2">CPICH_Ec/Ior</td><td>dB</td><td>-10</td><td>-10</td><td>-10</td></tr>
<tr><td colspan="2">PCCPCH_Ec/Ior</td><td>dB</td><td>-12</td><td>-12</td><td>-12</td></tr>
<tr><td colspan="2">SCH_Ec/Ior</td><td>dB</td><td>-12</td><td>-12</td><td>-12</td></tr>
<tr><td colspan="2">PICH_Ec/Ior</td><td>dB</td><td>-15</td><td>-15</td><td>-15</td></tr>
<tr><td colspan="2">DPCH_Ec/Ior</td><td>dB</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="2">OCNS_Ec/Ior</td><td>dB</td><td>-0.94</td><td>-0.94</td><td>-0.94</td></tr>
<tr><td rowspan="4">Ioc</td><td>Band I, IV, VI, X, XIX</td><td rowspan="4">dBm/ 3.84 MHz</td><td rowspan="4">-52.22+TT</td><td rowspan="4">-87.27+TT</td><td>-94.46+TT</td></tr>
<tr><td>Band II, V, VII, XI</td><td>-92.46+TT</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV</td><td>-91.46+TT</td></tr>
<tr><td>Band IX (Note 2)</td><td>-93.46+TT</td></tr>
<tr><td colspan="2">Îor/Ioc</td><td>dB</td><td>-1.75+TT</td><td>-4.7+TT</td><td>-9.54+TT</td></tr>
<tr><td colspan="2">CPICH Ec/Io, Note 1</td><td>dBm</td><td>-14.0+TT</td><td>-16.0+TT</td><td>-20.0+TT</td></tr>
<tr><td rowspan="4">Io, Note 1</td><td>Band I, IV, VI, X, XIX</td><td rowspan="4">dBm/ 3.84 MHz</td><td rowspan="4">-50+TT</td><td rowspan="4">-86+TT</td><td>-94+TT</td></tr>
<tr><td>Band II, V, VII, XI</td><td>-92.0+TT</td></tr>
<tr><td>Band III, VIII, XII, XIII, XIV</td><td>-91.0+TT</td></tr>
<tr><td>Band IX (Note 2)</td><td>-93+TT</td></tr>
<tr><td colspan="2">Propagation condition</td><td>-</td><td>AWGN</td><td>AWGN</td><td>AWGN</td></tr>
<tr><td colspan="6">NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.</td></tr>
</table>

Each UTRAN FDD CPICH Ec/No absolute measurement accuracy test shall meet the accuracy test requirements in table 9.4.1.5-1 and the reported values test requirements in table 9.4.1.5-5.

Table 9.4.1.5-5: UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X
Highest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X
Extreme Conditions			
Lowest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X
Highest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X

9.4.2 E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

9.4.2.1 Test purpose

To verify that the E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute measurement accuracy is within the specified limits.

9.4.2.2 Test applicability

This test applies to all types of E-UTRA TDD UE release 9 and forward that support UTRA FDD.

9.4.2.3 Minimum conformance requirements

The accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No.

The accuracy requirements in table 9.4.2.3-1 are valid under the following conditions:

$CPICH\_RSCP1,2|_{dBm} \geq -114$ dBm for Bands I, IV, VI, X, XI, XIX and XXI,

$CPICH\_RSCP1,2|_{dBm} \geq -113$ dBm for Band IX

$CPICH\_RSCP1,2|_{dBm} \geq -112$ dBm for Bands II, V and VII,

$CPICH\_RSCP1,2|_{dBm} \geq -111$ dBm for Band III, VIII, XII, XIII, XIV and XX.

$$\left| CPICH\_RSCP1|_{in\ dBm} - CPICH\_RSCP2|_{in\ dBm} \right| \leq 20dB$$

$$\left. \frac{I_o}{\left(\hat{I}_{or}\right)} \right|_{in\ dB} - \left. \left(\frac{CPICH\_E_c}{I_{or}} \right) \right|_{in\ dB} \leq 20dB$$

Table 9.4.2.3-1: CPICH_Ec/Io Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions			
		Normal condition	Extreme condition	Band I, IV, VI, X, XI, XIX and XXI	Band II, V and VII	Band III, VIII, XII, XIII, XIV and XX	Band IX
				Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]	Io [dBm/3,84 MHz]
The lower of the CPICH_Ec/Io from cell1 and cell2	dB	± 1.5 for -14 ≤ CPICH Ec/Io ± 2 for -16 ≤ CPICH Ec/Io < -14 ± 3 for -20 ≤ CPICH Ec/Io < -16	± 3	-94...-50	-92…-50	-91…-50	-93...-50

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in TS 36.133 [4] clause 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH Ec/No is defined in Table 9.4.2.3-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.4.2.3-2: CPICH_Ec/Io measurement report mapping

Reported value	Measured quantity value	Unit
CPICH_Ec/No _00	CPICH Ec/Io < -24	dB
CPICH_Ec/No _01	-24 ≤ CPICH Ec/Io < -23.5	dB
CPICH_Ec/No _02	-23.5 ≤ CPICH Ec/Io < -23	dB
…	…	…
CPICH_Ec/No _47	-1 ≤ CPICH Ec/Io < -0.5	dB
CPICH_Ec/No _48	-0.5 ≤ CPICH Ec/Io < 0	dB
CPICH_Ec/No _49	0 ≤ CPICH Ec/Io	dB

The normative reference for this requirement is TS 25.133 [21] clauses 9.1.2.2.2 and TS 36.133 [4] clause 9.2.3 and A.9.4.2.

9.4.2.4 Test description

9.4.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.2.

Channel Bandwidth to be tested: 10MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.
2. The general test parameter settings are set up according to Table 9.4.2.4.1-1.
3. Propagation conditions are set according to Annex B clause B.0.
4. Message contents are defined in clause 9.4.2.4.3.
5. Cell 1 is the serving E-UTRAN TDD cell and Cell 2 is the target UTRAN FDD cell. Cell 1 is the cell used for connection setup with the power levels set according to Annex C.0 and C.1 for this test.

Table 9.4.2.4.1-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth ($BW_{channel}$)	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

9.4.2.4.2 Test procedure

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.4.2.5-1 as appropriate. Propagation conditions are set according to Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message on Cell 1.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check CPICH_Ec/Io reported values of Cell 2 in MeasurementReport messages according to Table 9.4.2.5-3.

7. Repeat step 1-6 until the confidence level according to Tables G.2.3-1 in Annex G.2 is achieved.

8. Repeat step 1-7 for each sub-test in Table 9.4.2.5-1 as appropriate.

9.4.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.4.2.4.3-1: *MeasConfig- DEFAULT:* Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObject EUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.4.2.4.3-2: *MeasResults*: Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResults ::= SEQUENCE {			
measId	1		
measResultServCell			
rsrpResult	INTEGER(0..97)		
rsrqResult	INTEGER(0..34)		
}			
measResultNeighCells CHOICE {			
measResultListUTRA	MeasResultListUTRA		
}			
}			

Table 9.4.2.4.3-3: MeasResultListUTRA: Additional E-UTRAN TDD - UTRA FDD CPICH Ec/No absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsLIstEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physCellId CHOICE {			
fdd	PhysCellIdUTRA-FDD		
tdd	Not Present		
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
locationAreaCode	LocationAreaCode		
routingAreaCode	RoutingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-EcN0	According to specific test		
}			
}			

9.4.2.5 Test requirement

The test parameters are given in Tables 9.4.2.4.1-1, 9.4.2.5-1 and 9.4.2.5-2 as below. Table 9.4.2.5-1 and 9.4.2.5-2 define the primary level settings including test tolerances for all tests.

Each UTRAN FDD CPICH Ec/No absolute measurement accuracy test shall meet the reported values test requirements in table 9.4.2.5-3.

Table 9.4.2.5-1: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number		1		
$BW_{channel}$	MHz	10		
Special subframe configuration[Note1]		6		
Uplink-downlink configuration[Note1]		1		
OCNG Patterns defined in D.2.1 (OP.1 TDD)		OP.1 TDD		
PBCH_RA	dB	0		
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB			
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA[Note 2]	dB			
OCNG_RB[Note 2]	dB			
N_{oc} [Note 3]	dBm/15 kHz	-98		
RSRP [Note 4]	dBm/15 kHz	-94		
$\hat{E}_s/I_{ot}$	dB	4		
SCH_RP [Note 4]	dBm/15 kHz	-94		
$\hat{E}_s/N_{oc}$	dB	4		
Propagation Condition		AWGN		

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.
Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 9.4.2.5-2: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter		Unit	Test 1	Test 2	Test 3
			Cell 2	Cell 2	Cell 2
CPICH_Ec/Ior		dB	-10	-10	-10
PCCPCH_Ec/Ior		dB	-12	-12	-12
SCH_Ec/Ior		dB	-12	-12	-12
PICH_Ec/Ior		dB	-15	-15	-15
DPCH_Ec/Ior		dB	-	-	-
OCNS_Ec/Ior		dB	-0.94	-0.94	-0.94
Ioc	Band I, IV, VI, X, XIX	dBm/ 3.84 MHz	-52.22+TT	-87.27+TT	-94.46+TT
	Band II, V, VII, XI				-92.46+TT
	Band III, VIII, XII, XIII, XIV				-91.46+TT
	Band IX (Note 2)				-93.46+TT
Îor/Ioc		dB	-1.75+TT	-4.7+TT	-9.54+TT
CPICH Ec/Io, Note 1		dBm	-14.0+TT	-16.0+TT	-20.0+TT
Io, Note 1	Band I, IV, VI, X, XIX	dBm/ 3.84 MHz	-50+TT	-86+TT	-94+TT
	Band II, V, VII, XI				-92.0+TT
	Band III, VIII, XII, XIII, XIV				-91.0+TT
	Band IX (Note 2)				-93+TT
Propagation condition		-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.
NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

Table 9.4.2.5-3: UTRAN FDD CPICH Ec/No absolute measurement accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X
Highest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X
Extreme Conditions			
Lowest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X
Highest reported value	CPICH_Ec/No_X	CPICH_Ec/No_X	CPICH_Ec/No_X

9.5 Void

TBD

9.6 GSM carrier RSSI

9.6.1 GSM RSSI absolute accuracy for E-UTRAN FDD

FFS

9.6.2 GSM RSSI absolute accuracy for E-UTRAN TDD

Editor's note: This section is incomplete. The following aspects are either missing or not yet determined:

- *The Test system uncertainties applicable to this test are undefined*

- *The Test tolerances applicable to this test are undefined*

9.6.2.1 Test purpose

To verify that the GSM RSSI measurement accuracy is within the specified limits.

9.6.2.2 Test applicability

this test applies all the types of E-UTRA TDD Release 9 and forward that support GSM.

9.6.2.3 Minimum conformance requirements

Table 9.6.2.3-1: GSM RX_LEV absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Input level dBm
RX_LEV	dBm	± 4	± 6	-110…-70
	dBm	± 6	± 6	-70…-48
	dBm	± 9	± 9	-48..-38

RXLEV 0 = less than -110 dBm.

RXLEV 1 = -110 dBm to -109 dBm

RXLEV 2 = -109 dBm to -108 dBm

...

RXLEV 62 = -49 dBm to -48 dBm

RXLEV 63 = greater than -48 dBm

The normative reference for this requirement is TS 36.133 clause 9.4.1

9.6.2.4 Test description

9.6.2.4.1 Initial conditions

Test Environment: Normal, TL/VL, TL/VH, TH/VL, TH/VH; as defined in TS 36.508 [7] clause 4.1.

Frequencies to be tested: According to Annex E table E-1 and TS 36.508 [7] clauses 4.4.2 and 4.3.1.1.

Channel Bandwidth to be tested: 10 MHz as defined in TS 36.508 [7] clause 4.3.1.2.

1. Connect the SS (node B emulator) and AWGN noise sources to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure A.14.

2. Propagation conditions are set according to See TS 36.521-1 Annex B.

3. Message contents are defined in clause 9.6.2.4.3.

4. There is one E-UTRA TDD cell and one GSM cell specified in each test. Cell 1 is the cell used for call setup with the power level set according to TS 36.521-1 Annex C.0 and TS 36.521-3 Annex C.1 for this test.

Table 9.6.1.4-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Target quality value on DTCH	BLER	0.01	
Active cell	-	Cell 1	
DRX	-	OFF	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Gap pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

9.6.2.4.2 Test procedure

The three tests consist of Cell 1, serving cell and Cell 2, target cell.

1. Ensure the UE is in State 3A or 3A-RF according to TS 36.508 [7] clause 4.5.3A or 5.2A.2.
2. Set the parameters according to Table 9.6.2.5-1 and 9.6 2.5-2 as appropriate. Propagation conditions are set according to TS 36.521-1 Annex B clause B.1.1.
3. SS shall transmit an RRCConnectionReconfiguration message.
4. The UE shall transmit RRCConnectionReconfigurationComplete message.
5. UE shall transmit periodically MeasurementReport messages.
6. SS shall check the GSM RSSI value in MeasurementReport messages according to 9.6.2.5-4.
7. The SS shall check MeasurementReport messages transmitted by the UE until the confidence level according to TS 36.521-3 Tables G.2.3-1 in Annex G.2 is achieved.
8. Repeat step 1-7 for each sub-test in Table 9.6.2.5-2 and 9.6.2.5-3 as appropriate.

9.6.2.4.3 Message contents

Message contents are according to TS 36.508 [7] values 4.6 with the following exceptions:

Table 9.6.2.4-2: MeasuredResults: Additional GSM RSSI measurement accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServing SEQUENCE {			
rsrpResult	RSRP-Range	Set according to specific test	
rsrqResult	RSRQ-Range	Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
MeasResultListGERAN	MeasResultListGERAN		
}			
}			

Table 9.6.2.4-3: MeasResultListGERAN: Additional GSM measurement accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListGERAN::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
carrierFreq	CarrierFreqGERAN		
physCellId	physCellId GERAN		
Cgi-Info SEQUENCE{			
cellGloabalId	CellGlobalIdGERAN		
routingAreaCode	BIT STRING (SIZE (8))		
}			
measResult SEQUENCE {			
Rssi	INTEGER (0..63)	Set according to specific test	
}			
}			

9.6.2.5 Test requirement

Table 9.6.2.5-1 and 9.6.2.5-2 defines the primary level settings including test tolerances for all tests.

Each GSM RSSI measurement accuracy test shall meet the accuracy test requirements in Table 9.6.2.5-1.

The GSM RSSI measurement accuracy test for the reported values shall meet the requirements in Table 9.6.2.5-4.

Table 9.6.2.5-1: GSM RX_LEV absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Input level dBm
RX_LEV	dBm	± 4+TT	± 6+TT	-110…-70
	dBm	± 6+TT	± 6+TT	-70…-48
	dBm	± 9+TT	± 9+TT	-48..-38

RXLEV 0 = less than -110 dBm.

RXLEV 1 =-110 dBm to -109 dBm

RXLEV 2 =-109 dBm to -108 dBm

...

RXLEV 62 = -49 dBm to -48 dBm

RXLEV 63 = greater than -48 dBm

The normative reference for this requirement is TS 36.133 clause 9.4.1

Annex A (normative): Measurement Channels

A.1 PDSCH

A.1.1 FDD

Table A.1.1-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value					
Reference channel		R.2 FDD			R.0 FDD	R.1 FDD	
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1			1	2	
Allocated resource blocks (Note 4)		2			24	24	
Allocated subframes per Radio Frame		10			10	10	
Modulation		QPSK			QPSK	QPSK	
Target Coding Rate		1/3			1/3	1/3	
Information Bit Payload							
For Sub-Frames 4, 9	Bits	120			2088	2088	
For Sub-Frame 5	Bits	104			2088	1736	
For Sub-Frame 0	Bits	32			1736	1736	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0			0	0	
Number of Code Blocks per Sub-Frame (Note 5)							
For Sub-Frames 4, 9		1			1	1	
For Sub-Frame 5		1			1	1	
For Sub-Frame 0		1			1	1	
For Sub-Frame 1, 2, 3, 6, 7, 8		0			0	0	
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4, 9	Bits	456			6624	6336	
For Sub-Frame 5	Bits	360			6336	6048	
For Sub-Frame 0	Bits	176			5784	5520	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0			0	0	
Max. Throughput averaged over 1 frame	kbps	37.6			800	765	

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW.
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].
Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].
Note 4: Allocation is located in the middle of bandwidth.
Note 5: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.1.2 TDD

Table A.1.2-1: PDSCH Reference Measurement Channels for TDD

Parameter	Unit	Value					
Reference channel		R.2 TDD			R.0 TDD	R.1 TDD	
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1			1	2	
Allocated resource blocks (Note 4)		2			24	24	
Uplink-Downlink Configuration (Note 5)		1			1	1	
Special Subframe Configuration (Note 6)		6			6	6	
Allocated subframes per Radio Frame		6			6	6	
Modulation		QPSK			QPSK	QPSK	
Target Coding Rate		1/3			1/3	1/3	
Information Bit Payload							
For Sub-Frames 4,9	Bits	120			2088	2088	
For Sub-Frame 5	Bits	104			2088	2088	
For Sub-Frame 0	Bits	56			2088	1736	
For Sub-Frame 1, 6 (DwPTS)	Bits	56			1032	1032	
Number of Code Blocks per Sub-Frame (Note 7)							
For Sub-Frames 4,9		1			1	1	
For Sub-Frame 5		1			1	1	
For Sub-Frame 0		1			1	1	
For Sub-Frame 1, 6 (DwPTS)		1			1	1	
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits	456			6624	6336	
For Sub-Frame 5	Bits	408			6480	6192	
For Sub-Frame 0	Bits	224			5928	5664	
For Sub-Frame 1, 6 (DwPTS)	Bits	272			3696	3504	
Max. Throughput averaged over 1 frame	Mbps	0.05612			1.0416	1.0064	

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.

Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].4 symbols allocated to PDCCH for 1.4 MHz channel BW

Note 3: If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [9].

Note 4: Allocation is located in the middle of bandwidth. If necessary the information bit payload size can be adjusted to facilitate the test implementation. The payload sizes are defined in 3GPP TS 36.213 [8].

Note 5: As per Table 4.2-2 in TS 36.211 [16].

Note 6: As per Table 4.2-1 in TS 36.211 [16].

Note 7: f more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit).

Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.2 PCFICH/PDCCH/PHICH

A.2.1 FDD

Table A.2.1-1: PCFICH/PDCCH/PHICH Reference Channel for FDD

Parameter	Unit	Value					
Reference channel		R.8 FDD			R.6 FDD	R.7 FDD	
Channel bandwidth	MHz	1.4			10	10	
Number of transmitter antennas		1			1	2	
Control region OFDM symbolsNote1	symbols	4			2	2	
Aggregation level	CCE	2 (Note 6)			8	8	
DCI Format		Note 3			Note 3	Note 3	
Cell ID		Note 4			Note 4	Note 4	
Payload (without CRC)	Bits	Note 5			Note 5	Note 5	
Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCI formats are defined in 3GPP TS 36.212. Note 3: DCI format shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration. Note 5: Payload size shall depend upon the test configuration. Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.							

A.2.2 TDD

Table A.2.2-1: PCFICH/PDCCH/PHICH Reference Channel for TDD

Parameter	Unit	Value					
Reference channel		R.8 TDD			R.6 TDD	R.7 TDD	
Channel bandwidth	MHz	1.4			10	10	
Number of transmitter antennas		1			1	2	
Control region OFDM symbols[Note1]	symbols	4 (Note 6)			2	2	
Aggregation level	CCE	2 (Note 7)			8	8	
DCI Format		Note 3			Note 3	Note 3	
Cell ID		Note 4			Note 4	Note 4	
Payload (without CRC)	Bits	Note 5			Note 5	Note 5	
Note 1: The control region consists of PCFICH, PHICH and PDCCH. Note 2: DCI formats are defined in 3GPP TS 36.212. Note 3: DCI format shall depend upon the test configuration. Note 4: Cell ID shall depend upon the test configuration. Note 5: Payload size shall depend upon the test configuration. Note 6: Only 2 OFDM symbols for special subframes 1 and 6. Note 7: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.							

A.3 PUSCH

This rule applies to E-UTRA cell(s), which the UE is connected to. The UE is in RRC-CONNECTED mode.

When signalling or data payloads are expected to be sent on the PUSCH, the UE may be provided in advance with PUSCH resources by the SS. For sake of simplicity the PUSCH scheduling may also occur continuously over many consecutive subframes. These options shall not be used if:
1) stated otherwise in the test description, or
2) the transmission of PUSCH and UL scheduling information affects the test purpose (e.g. DRX, PUCCH reception etc.)

For handover test cases, after RRC Connection reconfiguration message implying handover is sent, the UE shall be provided continuously with PUSCH resources by the SS in the source cell. This is done in order to make the requirement UE implementation agnostic, w.r.t. different delays caused by different handling of positive RLC acknowledgements, which are not mandatory and of lower priority than the handover procedure progress (Subclause 5.3.5.4 [5]).

If a PUSCH scheduling occurs, the SS sends uplink scheduling information via PDCCH DCI format 0 for C-RNTI to the UE. The UE sends uplink MAC padding bits on the PUSCH.

Annex B (normative): Propagation Conditions

B.0 No interference

See TS 36.521-1[10] Annex B. 0.

B.1 Static propagation condition

See TS 36.521-1[10] Annex B.1 and B.1.1

B.2 Multi-path fading Propagation Conditions

See TS 36.521-1[10] Annex B.2,B.2.1 and B.2.2

Annex C (normative): Downlink Physical Channels

C.0 Downlink signal

See TS 36.521-1[10] Annex C.0.

C.1 General

See TS 36.521-1[10] Annex C.1.

C.2 Set-up

.See TS 36.521-1[10] Annex C.2.

Annex D (normative): OFDMA Channel Noise Generator (OCNG)

D.1 OCNG Patterns for FDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test) and/or allocations used for MBSFN. The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

The system information is scheduled in the allocations reserved for the OCNG patterns, in the subframes without MBSFN transmission. For this purpose the number of the allocated RB-s in the OCNG patterns can be reduced as necessary.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols with and without reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a constant transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given respectively by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

D.1.1 OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		

0 - 12	0	0	0	N/A	Note 1	N/A
37 - 49	0	0	0	N/A		
0-49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz

Table D.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 - 3, 6 - 8		
0 - 49	0	0	0	N/A	Note 1	N/A
0 - 49	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.3 OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.1.3-1: OP.3 FDD: OCNG FDD Pattern 3

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4,9	1-3, 6-8		
0 - 1	0	0	0	N/A	Note 1	N/A
4 - 5	0	0	0	N/A		
0 - 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.1.4-1: OP.4 FDD: OCNG FDD Pattern 4

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**	**PMCH Data**
	Subframe					
	0	5	4, 9	1 - 3, 6 - 8		

0 - 5	0	0	0	N/A	Note 1	N/A
0 - 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0 dB for 1 transmit antenna with CRS, +3 dB for 2 transmit antennas with CRS.

N/A: Not Applicable

D.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)

Table D.1.5-1: OP.5 FDD: OCNG FDD Pattern 5

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 12	0	0	0	N/A	Note 2
37 - 49	0	0	0	N/A	
0 - 49	N/A	N/A	N/A	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.6 OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN)

Table D.1.6-1: OP.6 FDD: OCNG FDD Pattern 6

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 49	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)

Table D.1.7-1: OP.7 FDD: OCNG FDD Pattern 7

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	4, 9	1 - 3, 6 - 8	
0 - 5	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

D.2 OCNG Patterns for TDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test). The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

The system information is scheduled in the allocations reserved for the OCNG patterns. For this purpose the number of the allocated RB-s in the OCNG patterns can be reduced as necessary.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols with and without reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i\_RA / OCNG\_RA = PDSCH_i\_RB / OCNG\_RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. For any aggregation and PHICH allocation, the PDCCH and any unused PHICH groups are padded with resource element groups with a power level given respectively by PDCCH_RA/RB and PHICH_RA/RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

D.2.1 OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz

Table D.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3, 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 12	0	0	0	0	Note 2
37 - 49	0	0	0	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [9]. The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.2 OCNG TDD pattern 2: full bandwidth allocation in 10 MHz

Table D.2.2-1: OP.2 TDD: OCNG TDD Pattern 2 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 49	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211[9]. The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table D.2.3-1: OP.3 TDD: OCNG TDD Pattern 3 for 5 ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 1	0	0	0	0	Note 2
4 - 5	0	0	0	0	

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [9].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

D.2.4 OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz

Table D.2.4-1: OP.4 TDD: OCNG TDD Pattern 4 for 5 ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**Relative power level** γ_{PRB} **[dB]**				**PDSCH Data**
	Subframe (Note 1)				
	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe) Note 3	
0 - 5	0	0	0	0	Note 2

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.The parameter γ_{PRB} is used to scale the power of PDSCH.
Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [9].
Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Annex E (normative): Cell configuration mapping

The cells used in TS 36.521-3 do not correspond to the cells defined in TS 36.508 [7] section 4.4.2. Table E-1 describes the mapping between cells described in TS 36.521-3 and those defined in TS 36.508 [7]. For each test case the cells as defined in TS 36.508 [7] section 4.4.2 are listed in one row. The test case shall apply the RF parameters as defined in TS 36.521-3 according to the column heading.

NOTE: For example if the second cell in a test case is an inter-frequency cell then Cell3 from TS 36.508 [7] section 4.4.2 is used with the radio parameters as defined for Cell2 in TS 36.521-3.

Table E-1: Cell configuration mapping for RRM testing

Test Case	Description	36.521-3 Cell1	36.521-3 Cell2		
4.2.1	RRC IDLE / E-UTRAN Cell Reselection / FDD - FDD cell re-selection intra frequency case	Cell1	Cell11		
4.2.2	RRC IDLE / E-UTRAN Cell Reselection / TDD - TDD cell re-selection intra frequency case	Cell1	Cell11		
4.2.3	RRC IDLE / E-UTRAN Cell Reselection / FDD - FDD cell re-selection inter frequency case	Cell6	Cell23		
4.2.4	RRC IDLE / E-UTRAN Cell Reselection / FDD - TDD cell re-selection inter frequency case	Cell1	Cell23		
4.2.5	RRC IDLE / E-UTRAN Cell Reselection / TDD - FDD cell re-selection inter frequency case	Cell23	Cell6		
4.2.6	RRC IDLE / E-UTRAN Cell Reselection / TDD - TDD cell re-selection inter frequency case	Cell6	Cell23		
4.3.1.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA is of higher priority	Cell3	Cell9		
4.3.1.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA is of lower priority	Cell3	Cell9		
4.3.1.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority	Cell3	Cell9		
4.3.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD - UTRAN TDD cell re-selection	Cell1	Cell8		
4.3.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN FDD cell re-selection	Cell6	Cell8		
4.3.4.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of higher priority	Cell1	Cell8		
4.3.4.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD - UTRAN TDD cell re-selection: UTRA is of lower priority	Cell1	Cell8		
4.4.1	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN FDD - GSM cell re-selection	Cell1	Cell26		
4.4.2	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN TDD - GSM cell re-selection	Cell1	Cell26		
4.5.1.1	RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD - HRPD cell re-selection: HRPD is of lower priority	Cell1	[Cell15]		
4.6.1.1	RRC IDLE / E-UTRAN to cdma2000 1xRTT Cell re-selection / E-UTRAN FDD - cdma2000 1xRTT cell re-selection: cdma2000 1x is of lower priority	Cell1	[Cell19]		
5.1.1	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Intra frequency case	Cell1	Cell2		
5.1.2	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Intra frequency case	Cell1	Cell2		
5.1.3	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Inter frequency case	Cell6	Cell3		
5.1.4	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Inter frequency case	Cell6	Cell3		
5.1.5	RRC CONNECTED / E-UTRAN Handover / FDD - FDD / Inter frequency case: unknown target cell	Cell6	Cell3		
5.1.6	RRC CONNECTED / E-UTRAN Handover / TDD - TDD / Inter frequency case: unknown target cell	Cell6	Cell3		
5.2.1	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD - UTRAN FDD handover	Cell3	Cell9		
5.2.2	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN TDD - UTRAN FDD handover	Cell6	Cell8		
5.2.3	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to GSM / E-UTRAN FDD - GSM handover	Cell1	Cell26		
5.2.4	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN TDD - UTRAN TDD handover	Cell3	Cell9		
5.2.5	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD - UTRAN TDD handover	Cell1	Cell8		
5.2.6	RRC CONNECTED / Handover from E-UTRAN to other RATs	Cell1	Cell26		

	/ From E-UTRAN to GSM / E-UTRA TDD - GSM handover				
5.2.7	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - UTRAN FDD handover: unknown target cell	Cell3	Cell9		
5.2.8	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN FDD - GSM handover: unknown target cell	Cell1	Cell26		
5.2.9	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN TDD - GSM Handover: unknown target cell	Cell1	Cell26		
5.2.10	RRC CONNECTED / Handover from E-UTRAN to other RATs / E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	Cell1	Cell8		
5.3.1	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD handover	Cell1	[Cell15]		
5.3.2	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – cdma2000 1xRTT handover	Cell1	[Cell19]		
5.3.3	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD – HRPD Handover: unknown target cell	Cell1	[Cell15]		
5.3.4	RRC CONNECTED / Handover from E-UTRAN to non-3GPP RATs / E-UTRAN FDD - cdma2000 1xRTT Handover: unknown target cell	Cell1	[Cell19]		
6.1.1	RRC Connection Mobility Control / E-UTRAN FDD Intra-frequency RRC Re-establishment	Cell1	Cell2		
6.1.2	RRC Connection Mobility Control / E-UTRAN FDD Inter-frequency RRC Re-establishment	Cell6	Cell3		
6.1.3	RRC Connection Mobility Control / E-UTRAN TDD Intra-frequency RRC Re-establishment	Cell1	Cell2		
6.1.4	RRC Connection Mobility Control / E-UTRAN TDD Inter-frequency RRC Re-establishment	Cell6	Cell3		
6.2.1	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Contention Based Random Access	Cell1			
6.2.2	RRC Connection Mobility Control / Random Access / E-UTRAN FDD - Non-Contention Based Random Access	Cell1			
6.2.3	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Contention Based Random Access	Cell1			
6.2.4	RRC Connection Mobility Control / Random Access / E-UTRAN TDD - Non-Contention Based Random Access	Cell1			
7.1.1	E-UTRAN FDD-UE Transmit Timing Accuracy	Cell1			
7.1.2	E-UTRAN TDD-UE Transmit Timing Accuracy	Cell1			
7.2.1	E-UTRAN FDD-UE Timing Advance Adjustment Accuracy	Cell1			
7.2.2	E-UTRAN TDD-UE Timing Advance Adjustment Accuracy	Cell1			
7.3.1	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	Cell1			
7.3.2	E-UTRAN FDD Radio Link Monitoring Test for In-sync	Cell1			
7.3.3	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	Cell1			
7.3.4	E-UTRAN TDD Radio Link Monitoring Test for In-sync	Cell1			
7.3.5	E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	Cell1			
7.3.6	E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	Cell1			
7.3.7	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	Cell1			
7.3.8	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	Cell1			
8.1.1	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell1	Cell2		
8.1.2	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.1.3	UE Measurement Procedures / E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2		
8.1.4	Void				
8.2.1	UE Measurement Procedures / E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.2.2	UE Measurement Procedures / E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Cell1	Cell2		
8.3.1	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting under fading propagation conditions in asynchronous cells	Cell6	Cell3		

8.3.2	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Cell6	Cell3		
8.3.3	UE Measurement Procedures / E-UTRAN FDD-FDD inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	Cell6	Cell3		
8.4.1	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell6	Cell3		
8.4.2	UE Measurement Procedures / E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Cell6	Cell3		
8.5.1	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell3	Cell9		
8.5.2	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions	Cell3	Cell9		
8.5.3	UE Measurement Procedures / E-UTRAN FDD - UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions	Cell3	Cell9		
8.6.1	UE Measurement Procedures / E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell8		
8.7.1	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	Cell1	Cell8		
8.7.2	UE Measurement Procedures / E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	Cell1	Cell8		
8.7.3	E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	Cell1	Cell8		
8.8.1	UE Measurement Procedures / E-UTRAN FDD - GSM event triggered reporting in AWGN	Cell6	Cell26		
8.8.2	UE Measurement Procedures / E-UTRAN FDD - GSM event triggered reporting when DRX is used in AWGN	Cell6	Cell26		
8.9.1	UE Measurement Procedures / E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	Cell1	Cell8		
8.10.1	UE Measurement Procedures / E-UTRAN TDD - GSM event triggered reporting in AWGN	Cell6	Cell26		
8.10.2	UE Measurement Procedures / E-UTRAN TDD - GSM event triggered reporting when DRX is used in AWGN	Cell6	Cell26		
8.11.1	UE Measurement Procedures / Monitoring of multiple layers / E-UTRAN FDD - E-UTRAN FDD and E-UTRAN FDD Inter-frequency event triggered reporting under fading propagation conditions	Cell1	Cell3	Cell6	
8.11.2	UE Measurement Procedures / Monitoring of multiple layers / E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions	Cell1	Cell3	Cell6	
8.11.3	UE Measurement Procedures / Monitoring of multiple layers / InterRAT E-UTRA FDD to E-UTRA FDD and UTRA FDD cell search	Cell1	Cell6	Cell8	
8.11.4	UE Measurement Procedures / Monitoring of multiple layers / InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search	Cell1	Cell6	Cell8	
8.11.5	Combined E-UTRAN FDD - E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Cell1	Cell3	Cell24	
8.11.6	Combined E-UTRAN TDD - E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions	Cell1	Cell3	Cell24	
9.1.1.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Absolute	Cell1	Cell2		
9.1.1.2	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRP Accuracy / Relative	Cell1	Cell2		
9.1.2.1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRP Accuracy / Absolute	Cell1	Cell2		
9.1.2.2	Measurement Performance Requirements / E-UTRAN / TDD	Cell1	Cell2		

	Intra Frequency RSRP Accuracy / Relative				
9.1.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute	Cell6	Cell3		
9.1.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative	Cell6	Cell3		
9.1.4.1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Absolute	Cell6	Cell3		
9.1.4.2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative	Cell6	Cell3		
9.2.1.1	Measurement Performance Requirements / E-UTRAN / FDD Intra frequency RSRQ Accuracy / Absolute	Cell1	Cell2		
9.2.2.1	Measurement Performance Requirements / E-UTRAN / TDD Intra Frequency RSRQ Accuracy / Absolute	Cell1	Cell2		
9.2.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Absolute	Cell6	Cell3		
9.2.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Relative	Cell6	Cell3		
9.2.4.1	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Absolute	Cell6	Cell3		
9.2.4.2	Measurement Performance Requirements / E-UTRAN / TDD - TDD Inter Frequency RSRQ Accuracy / Relative	Cell6	Cell3		
9.3.1	Measurement Performance Requirements / E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy	Cell3	Cell9		
9.4.1	Measurement Performance Requirements / E- UTRAN FDD - UTRA FDD CPICH Ec/No absolute accuracy	Cell3	Cell9		

Annex F: Measurement uncertainties and Test Tolerances

Editor's note: Annex is incomplete. The following aspects are either missing or not yet determined:

- *In Annex F.1 the Acceptable uncertainty of Test System has not yet been defined for all tests*
- *In Annex F.3 the Derivation of Test Requirements has not yet been defined for all test*
- *The references to other specifications need to be formalised*

The requirements of this clause apply to all applicable tests in the present document.

F.1 Acceptable uncertainty of Test System (normative)

See TS 36.521-1[10] Annex F1.

F.1.1 Measurement of test environments

See TS 36.521-1[10] Annex F1.1.

F.1.2 Measurement of RRM requirements

Table F.1.2-1: Maximum Test System Uncertainty for RRM Requirements

Subclause	Maximum Test System Uncertainty[1]	Derivation of Test System Uncertainty
4.2.1 E-UTRA FDD - FDD cell re-selection intra frequency	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
4.2.2 E-UTRA TDD - TDD cell re-selection intra frequency	Same as 4.2.1	
4.2.3 E-UTRA FDD - FDD cell re-selection inter frequency	N_{oc1} ±0.7 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±0.7 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
4.2.6 E-UTRA TDD - TDD cell re-selection inter frequency	Same as 4.2.3	
4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority	E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or} / I_{oc} ±0.3 dB CPICH E_c / I_{or} ±0.1 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN I_{oc} is the AWGN on cell 2 (UTRA) frequency I_{or} / I_{oc} is the ratio of cell 2 signal / AWGN CPICH E_c / I_{or} is the fraction of cell 2 power assigned to the CPICH Physical channel
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	Same as 4.3.1.1	
4.4.1 E-UTRAN FDD - GSM cell re-selection	E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} $\hat{E}s / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Notes: N_{oc} is the AWGN on cell 1 (E-UTRA)frequency $\hat{E}s / N_{oc}$ is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
4.4.2 E-UTRAN TDD - GSM cell re-selection	Same as 4.4.1	
5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.3 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.3 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Same as 5.1.1	Same as 5.1.1
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	Same as 4.2.3	Same as 4.2.3
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Same as 4.2.3	Same as 4.2.3
5.1.5 E-UTRAN FDD-FDD inter-frequency Handover with unknown target cell	Same as 4.2.3	Same as 4.2.3
5.1.6 E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	Same as 4.2.3	Same as 4.2.3

5.2.3 E-UTRAN FDD - GSM handover	E-UTRA Cell N_{oc} ±0.7 dB averaged over BW_{Config} $Ês / N_{oc}$ ±0.3 dB averaged over BW_{Config} GSM cell Signal level ±0.7 dB	Note: N_{oc} is the AWGN on cell 1 frequency $Ês / N_{oc}$ is the ratio of cell 1 signal / AWGN Cell 2 (GSM) has only the wanted signal, without AWGN
5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell	E-UTRA cell N_{oc} ±0.7 dB averaged over BW_{Config} $Ês / N_{oc}$ ±0.3 dB averaged over BW_{Config} UTRA cell I_{oc} ±0.7 dB I_{or}/I_{oc} ±0.3 dB CPICH Ec/Ior ±0.1 dB	Note: N_{oc} is the AWGN on cell 1 frequency $Ês / N_{oc}$ is the ratio of cell 1 signal / AWGN Ioc is the AWGN on Cell 2 (UTRA) frequency Ior/Ioc is the ratio of Cell 2 signal/AWGN CPICH Ec/Ior is the fraction on Cell 2 power assigned to the CPICH physical channel
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell	Same as 5.2.3	Same as 5.2.3
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment	Same as 5.1.1	Same as 5.1.1
6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment	N_{oc1} ±1.0 dB averaged over BW_{Config} $Ês_1 / N_{oc1}$ ±0.3 dB averaged over BW_{Config} N_{oc2} ±1.0 dB averaged over BW_{Config} $Ês_2 / N_{oc2}$ ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN
6.2.1 E-UTRAN FDD - Contention Based Random Access Test	Test 1 and Test 2: N_{oc} ±0.7 dB averaged over BW_{Config} $Ês / N_{oc}$ ±0.3 dB averaged over BW_{Config} Uplink absolute power measurement ±0.7 dB Uplink relative power measurement ±0.7 dB ±3Ts Uplink signal transmit timing relative to downlink	Note: $Ês_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
6.2.2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.3 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
6.2.4 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy	N_{oc} ±3.0 dB averaged over BW_{Config} $Ês / N_{oc}$ ±0.3 dB ±3Ts Uplink signal transmit timing relative to downlink ±0.5Ts relative during UE timing adjustment	Note: $Ês / N_{oc}$ is the ratio of cell 1 signal / AWGN T_S = 1/(15000 x 2048) seconds, the basic timing unit defined in TS 36.211 [9]
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy	Same as 7.1.1	Same as 7.1.1

7.2.1 E-UTRAN FDD - UE Timing Advance Adjustment Accuracy	N_{oc1} ±3.0 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} ±0.3 dB Timing Advance Adjustment: ±0.5T_s	Note: $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN The timing unit T_S = 1/(15000 * 2048) seconds, as defined in TS.36.211 [9]
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy	Same as 7.2.1	Same as 7.2.1
7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	± 0.6dB (Subtest 1&2, AWGN conditions) ± 0.8dB (Subtest 3, Fading conditions, single antenna transmission) ± 0.9dB (Subtest 4, Fading conditions, two antenna transmission)	Subtests 1 & 2: Overall system uncertainty for AWGN condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Effect of AWGN flatness and signal flatness Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: AWGN flatness and signal flatness has x 0.25 effect on the required SNR, so use sensitivity factor of x 0.25 for the uncertainty contribution. Test System uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + (0.25 x AWGN flatness and signal flatness) ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB AWGN flatness and signal flatness ±2.0 dB Subtests 3: Overall system uncertainty for fading condition comprises three quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty 3. Effect of AWGN flatness and signal flatness Items 1, 2 and 3 are assumed to be uncorrelated so can be root sum squared: Test System uncertainty = SQRT (Average signal-to-noise ratio uncertainty ^{2} + Signal-to-noise ratio variation^2 + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Signal-to-noise ratio variation ±0.5 dB Fading profile power uncertainty ±0.5 dB for single Tx Subtest 4: Same calculations as for subtest 3 but with Fading profile uncertainty of ±0.7 for two Tx.
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync	± 0.8dB (Subtest 1, Fading conditions, single antenna transmission) ± 0.9dB (Subtest 2, Fading conditions, two antenna transmission)	Subtest 1: See 7.3.1 subtest 3 Subtest 2: See 7.3.1 subtest 4
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	Same as 7.3.1	Same as 7.3.1
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync	Same as 7.3.2	Same as 7.3.2
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	±0.9dB (Subtest 1, Fading conditions, two antenna transmission) ± 0.6dB (Subtest 2, AWGN conditions)	Subtest 1: See 7.3.1, subtest 4 Subtest 2: See 7.3.1, subtest 1
7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	± 0.6dB (AWGN conditions)	See 7.3.1, subtest 1

7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	±0.9dB (Subtest 1, Fading conditions, two antenna transmission) ± 0.6dB (Subtest 2, AWGN conditions)	Subtest 1: See 7.3.1, subtest 4 Subtest 2: See 7.3.1, subtest 1
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	± 0.6dB (AWGN conditions)	See 7.3.1, subtest 1
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc} ±1.0 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc}$ ±0.6 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc}$ ±0.6 dB averaged over BW_{Config}	Note: $\hat{E}s_1 / N_{oc}$ is the ratio of cell 1 signal / AWGN $\hat{E}s_2 / N_{oc}$ is the ratio of cell 2 signal / AWGN $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1
8.1.3 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1
8.2.1 E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1
8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	N_{oc1} ±0.7 dB averaged over BW_{Config} $\hat{E}s_1 / N_{oc1}$ ±0.6 dB averaged over BW_{Config} N_{oc2} ±0.7 dB averaged over BW_{Config} $\hat{E}s_2 / N_{oc2}$ ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1 / N_{oc1}$ is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2 / N_{oc2}$ is the ratio of cell 2 signal / AWGN Each $\hat{E}s / N_{oc}$ uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: $\hat{E}s / N_{oc}$ uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1

8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	N_{oc1} ±0.7 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.3 dB averaged over BW_{Config} N_{oc2} ±0.7 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.3 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	N_{oc1} ±0.7 dB averaged over BW_{Config} $Ês_1$ / N_{oc1} ±0.6 dB averaged over BW_{Config} N_{oc2} ±0.7 dB averaged over BW_{Config} $Ês_2$ / N_{oc2} ±0.6 dB averaged over BW_{Config}	Note: N_{oc1} is the AWGN on cell 1 frequency $Ês_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $Ês_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN Each Ês / N_{oc} uncertainty for fading condition comprises two quantities: 1. Signal-to-noise ratio uncertainty 2. Fading profile power uncertainty Items 1 and 2 are assumed to be uncorrelated so can be root sum squared: Ês / N_{oc} uncertainty = SQRT (Signal-to-noise ratio uncertainty ^{2} + Fading profile power uncertainty ^{2}) Signal-to-noise ratio uncertainty ±0.3 dB Fading profile power uncertainty ±0.5 dB
8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Same as 8.4.1	Same as 8.4.1
[TBD]	[TBD]	[TBD]
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	N_{oc} ±0.7 dB averaged over BW_{Config} N_{oc} ±1.0 dB for PRBs #22-27 $Ês_1$ / N_{oc} and $Ês_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc} and $Ês_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $Ês_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $Ês_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP	N_{oc} ±0.7 dB averaged over BW_{Config} N_{oc} ±1.0 dB for PRBs #22-27 $Ês_1$ / N_{oc} and $Ês_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $Ês_1$ / N_{oc} and $Ês_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $Ês_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $Ês_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.2 TDD Intra Frequency Relative RSRP Accuracy	Same as 9.1.1.2	Same as 9.1.1.2

9.1.3.1 FDD Inter Frequency Absolute RSRP Accuracy	N_{oc1} and N_{oc2} each ±0.7 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.0 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.3.2 FDD Inter Frequency Relative RSRP Accuracy	N_{oc1} and N_{oc2} each ±0.7 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.0 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.1.4.1 TDD Inter Frequency Absolute RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1
9.1.4.2 TDD Inter Frequency Relative RSRP Accuracy	N_{oc1} and N_{oc2} each ±0.7 dB averaged over BW_{Config} N_{oc1} and N_{oc2} each ±1.0 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: N_{oc1} is the AWGN on cell 1 frequency $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN N_{oc2} is the AWGN on cell 2 frequency $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	N_{oc} ±0.7 dB averaged over BW_{Config} N_{oc} ±1.0 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc} and $\hat{E}s_2$ / N_{oc} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc} is the ratio of cell 1 signal / AWGN $\hat{E}s_2$ / N_{oc} is the ratio of cell 2 signal / AWGN
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Same as 9.2.1.1	Same as 9.2.1.1
9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy	N_{oc1} ±0.7 dB averaged over BW_{Config} N_{oc1} ±1.0 dB for PRBs #22-27 N_{oc2} ±0.7 dB averaged over BW_{Config} N_{oc2} ±1.0 dB for PRBs #22-27 $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.3 dB averaged over BW_{Config} $\hat{E}s_1$ / N_{oc1} and $\hat{E}s_2$ / N_{oc2} each ±0.8 dB for PRBs #22-27	Note: $\hat{E}s_1$ / N_{oc1} is the ratio of cell 1 signal / AWGN on frequency 1 $\hat{E}s_2$ / N_{oc2} is the ratio of cell 2 signal / AWGN on frequency 2
9.2.3.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.1	
9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy	Same as 9.2.3.1	
9.2.4.2 TDD - TDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.1	

In addition, the following Test System uncertainties and related constraints apply. Any additional constraints are defined in the specific tests.	
AWGN Bandwidth	≥ 1.08MHz, 2.7MHz, 4.5MHz, 9MHz, 13.5MHz, 18MHz; N_{RB} x 180kHz according to BW_{Config}
AWGN absolute power uncertainty	Test-specific
AWGN flatness and signal flatness, max deviation for any Resource Block, relative to average over BW_{Config}	±2 dB
AWGN peak to average ratio	≥10 dB @0.001%
Signal-to noise ratio uncertainty	Test-specific
Fading profile power uncertainty	±0.5 dB
Fading profile delay uncertainty, relative to frame timing	±5 ns (excludes absolute errors related to baseband timing)

F.2 Interpretation of measurement results (normative)

See TS 36.521-1[10] Annex F2.

F.3 Test Tolerance and Derivation of Test Requirements (informative)

See TS 36.521-1[10] Annex F3.

F.3.1 Measurement of test environments

See TS 36.521-1[10] Annex F3.1.

F.3.2 Measurement of RRM requirements

Because the relationships between the Test system uncertainties and the Test Tolerances are often complex, it is not always possible to give a simple derivation of the Test Requirement in this document. The analysis is recorded in 3GPP TR 36 903 [20].

Table F.3.2-1: Derivation of Test Requirements (RRM tests)

Test	Minimum Requirement in TS 36.133	Test Tolerance (TT)	Test Requirement in TS 36.521-3
4.2.1 E-UTRA FDD - FDD cell re-selection intra frequency	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +16.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +13.00dB $\hat{E}s_2 / N_{oc}$: +16.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +16.00dB $\hat{E}s_2 / N_{oc}$: +13.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.45dB During T3: 0dB +0.45dB 0dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +16.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +13.00dB $\hat{E}s_2 / N_{oc}$: +16.45dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +16.45dB $\hat{E}s_2 / N_{oc}$: +13.00dB
4.2.2 E-UTRA TDD - TDD cell re-selection intra frequency	Same as 4.2.1	Same as 4.2.1	Same as 4.2.1
4.2.3 E-UTRA FDD - FDD cell re-selection inter frequency	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +14.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +12.00dB	During T1: -1.1dB +1.9dB -1.1dB +0.3dB During T2: -1.1dB +1.9dB -1.1dB 0dB During T3: -1.1dB +1.9dB -1.1dB +1.9dB	During T1: N_{oc1}: -99.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +15.90dB N_{oc2}: -99.1dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -3.70dB During T2: N_{oc1}: -99.1dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +15.90dB N_{oc2}: -99.1dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T3: N_{oc1}: -99.1dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +15.90dB N_{oc2}: -99.1dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +13.90dB
4.2.6 E-UTRA TDD - TDD cell re-selection inter frequency	Same as 4.2.3	Same as 4.2.3	Same as 4.2.3

4.3.1.1 E-UTRA FDD - UTRAN FDD cell reselection: UTRA FDD is of higher priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -∞dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +11.00dB CPICH_E_c/I_{or}: -10.00dB During T3: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: -5.00dB CPICH_E_c/I_{or}: -10.00dB	During T1: 0dB +0.8dB -0.1dB 0dB 0dB During T2: 0dB +0.8dB -0.1dB +0.9dB 0dB During T3: 0dB +0.8dB -0.1dB -0.7dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.80dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -∞dB CPICH_ E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.80dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: +11.90dB CPICH_ E_c/I_{or}: -10.00dB During T3: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +14.80dB UTRA Cell 2 I_{oc}: -70.10dBm/3.84MHz I_{or} / I_{oc}: -5.70dB CPICH_ E_c/I_{or}: -10.00dB
4.3.1.2 E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of lower priority	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +12.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.00dB CPICH_E_c/I_{or}: -10.00dB	During T1: -1.10dB +1.90dB 0dB +0.80dB 0dB During T2: -1.10dB +0.30dB 0dB +0.80dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: +13.90dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_ E_c/I_{or}: -10.00dB During T2: E-UTRA Cell 1 N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: -3.70dB UTRA Cell 2 I_{oc}: -70.00dBm/3.84MHz I_{or} / I_{oc}: +13.80dB CPICH_ E_c/I_{or}: -10.00dB
4.4.1 E-UTRAN FDD - GSM cell re-selection	During T1: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: +9.00dB GSM Cell 2 Signal level: -90.00dBm During T2: E-UTRA Cell 1 N_{oc}: -98.00dBm/15kHz Ês / N_{oc}: -4.00dB GSM Cell 2 Signal level: -75.0dBm	During T1: -1.1dB +0.9dB 0dB During T2: -1.1dB +0.3dB 0dB	During T1: E-UTRA Cell 1 N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: +9.90dB GSM Cell 2 Signal level: -90.00dBm During T2: E-UTRA Cell 1 N_{oc}: -99.10dBm/15kHz Ês / N_{oc}: -3.70dB GSM Cell 2 Signal level: -75.00dBm
4.4.2 E-UTRAN TDD - GSM cell re-selection	Same as 4.4.1	Same as 4.4.1	Same as 4.4.1

5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB +0.5dB During T3: 0dB 0dB +0.5dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +8.00dB $\hat{E}s_2 / N_{oc}$: +11.50dB During T3: N_{oc}: -98dBm /15kHz $\hat{E}s_1 / N_{oc}$: +8.00 $\hat{E}s_2 / N_{oc}$: +11.50dB
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Same as 5.1.1	Same as 5.1.1	Same as 5.1.1
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.0dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0.1dB During T3: 0dB 0dB 0dB +0.1dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.10dB During T3: N_{oc1}: -98dBm /15kHz $\hat{E}s_1 / N_{oc1}$: +4dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.10dB
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Same as 5.1.3	Same as 5.1.3	Same as 5.1.3
5.1.5 E-UTRAN FDD-FDD inter-frequency Handover with unknown target cell	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +7.0dB
5.1.6 E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +5.0dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: -infinity During T2: Noc1: -98dBm/15kHz Ês1 / Noc1: +4dB Noc2: -98dBm/15kHz Ês2 / Noc2: +5.0dB

5.2.7 E-UTRAN FDD - UTRAN FDD handover: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8 dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: 0dB UTRA Cell 2 Ioc: -70dBm/3.84MHz Ior / Ioc: -1.8dB
5.2.8 E-UTRAN FDD - GSM handover: unknown target cell	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm	During T1: 0dB 0dB During T2: 0dB 0dB 0dB	During T1: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -infinity During T2: E-UTRA Cell 1 Noc: -98dBm/15kHz Ês / Noc: +4dB GSM Cell 2 Signal level: -75 dBm
6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +7.00dB $Ês_2$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: -infinity $Ês_2$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $Ês_1$ / N_{oc}: -infinity $Ês_2$ / N_{oc}: +4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 0dB 0dB During T3: 0dB 0dB 0dB	During T1: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: +7.00dB $Ês_2$ / N_{oc}: +4.00dB During T2: N_{oc}: -98dBm/15kHz $Ês_1$ / N_{oc}: -infinity $Ês_2$ / N_{oc}: +4.00dB During T3: N_{oc}: -98dBm /15kHz $Ês_1$ / N_{oc}: -infinity $Ês_2$ / N_{oc}: +4.00dB
6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment	During T1: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: -infinity During T3: N_{oc1}: -98dBm /15kHz $Ês_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB During T3: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: +4.00dB N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: -infinity During T2: N_{oc1}: -98dBm/15kHz $Ês_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: -infinity During T3: N_{oc1}: -98dBm /15kHz $Ês_1$ / N_{oc1}: -infinity N_{oc2}: -98dBm/15kHz $Ês_2$ / N_{oc2}: +7.00dB

6.2.1 E-UTRAN FDD - Contention Based Random Access Test	Test 1 and Test 2 Absolute uplink power: Normal conditions ±9dB Extreme conditions ±12dB Relative uplink power step: Normal conditions ±3dB Extreme conditions ±5dB Uplink timing T_e: ±12T_s	 1.1dB 1.1dB 0.7dB 0.7dB 3T_s	Test 1 and Test 2 Absolute uplink power: Normal conditions ±10.1dB Extreme conditions ±13.1dB Relative uplink power step: Normal conditions ±3.7dB Extreme conditions ±5.7dB Uplink timing T_e: ±15T_s
6.2.2 E-UTRAN FDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.3 E-UTRAN TDD - Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
6.2.4 E-UTRAN TDD - Non Contention Based Random Access Test	Same as 6.2.1	Same as 6.2.1	Same as 6.2.1
7.1.1 E-UTRAN FDD - UE Transmit Timing Accuracy	Test 1 (10MHz Ch BW): Uplink timing: ±12T_s Max step size T_q: 2T_s Min adjust rate: 7T_s Max adjust rate: 2T_s Ês / N_{oc}: +3.00dB Test 2 (10MHz Ch BW): Uplink timing: ±12T_s Ês / N_{oc}: +3.00dB Test 3: (1.4MHz Ch BW) Uplink timing: ±24T_s Max step size T_q: 16T_s Min adjust rate: 7T_s Max adjust rate: 16T_s Ês / N_{oc}: +3.00dB	 ±3T_s 0.5T_s -0.5T_s 0.5T_s +0.3dB ±3T_s +0.3dB ±3T_s 0.5T_s -0.5T_s 0.5T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: ±15T_s Max step size T_q: 2.5T_s Min adjust rate: 6.5T_s Max adjust rate: 2.5T_s Ês / N_{oc}: +3.30dB Test 2 (10MHz Ch BW): Uplink timing: ±15T_s Ês / N_{oc}: +3.30dB Test 3: (1.4MHz Ch BW) Uplink timing: ±27T_s Max step size T_q: 16.5T_s Min adjust rate: 6.5T_s Max adjust rate: 16.5T_s Ês / N_{oc}: +3.30dB
7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy	Test 1 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Max step size T_q: 2T_s Min adjust rate: 7T_s Max adjust rate: 2T_s Ês / N_{oc}: +3.00dB Test 2 (10MHz Ch BW): Uplink timing: (624 ±12) x T_s Ês / N_{oc}: +3.00dB Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±24) x T_s Max step size T_q: 16T_s Min adjust rate: 7T_s Max adjust rate: 16T_s Ês / N_{oc}: +3.00dB	 ±3T_s 0.5T_s -0.5T_s 0.5T_s +0.3dB ±3T_s +0.3dB ±3T_s 0.5T_s -0.5T_s 0.5T_s +0.3dB	Test 1 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Max step size T_q: 2.5T_s Min adjust rate: 6.5T_s Max adjust rate: 2.5T_s Ês / N_{oc}: +3.30dB Test 2 (10MHz Ch BW): Uplink timing: (624 ±15) x T_s Ês / N_{oc}: +3.30dB Test 3: (1.4MHz Ch BW) Uplink timing: (624 ±27) x T_s Max step size T_q: 16.5T_s Min adjust rate: 6.5T_s Max adjust rate: 16.5T_s Ês / N_{oc}: +3.30dB
7.2.1 E-UTRAN FDD - UE Timing Advanced Adjustment Accuracy	Timing Advance Adjustment: ±4T_s	 0.5T_S	Timing Advance Adjustment: ±4.5T_s
7.2.2 E-UTRAN TDD - UE Timing Advance Adjustment Accuracy	Same as 7.2.2	Same as 7.2.2	Same as 7.2.2

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync	SNRs as specified	0.6dB (Subtests 1&2) 0.8dB (Subtest 3) 0.9dB (Subtest 4)	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT
7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync	SNRs as specified	0.8dB (Subtest 1) 0.9dB (Subtest 2)	During T1: Formula: SNR + TT During T2: Formula: SNR + TT During T3: Formula: SNR - TT During T4: Formula: SNR - TT During T5: Formula: SNR + TT
7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	SNRs as specified	Same as 7.3.1	Same as 7.3.1
7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync	SNRs as specified	Same as 7.3.2	Same as 7.3.2
7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX	SNRs as specified	0.9dB (Subtest 1) 0.6dB (Subtest 2)	Same as 7.3.1
7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX	SNRs as specified	0.6dB	Same as 7.3.2
7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX	SNRs as specified	0.9dB (Subtest 1) 0.6dB (Subtest 2)	Same as 7.3.1
7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	SNRs as specified	0.6dB	Same as 7.3.2
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: +4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 2.10dB 2.10dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +4.00dB $\hat{E}s_2$ / N_{oc}: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1$ / N_{oc}: +6.10dB $\hat{E}s_2$ / N_{oc}: +6.10dB
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1
8.1.3 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.1.1	Same as 8.1.1	Same as 8.1.1

8.2.1 E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: +4.00dB	During T1: 0dB 0dB 0dB During T2: 0dB 2.60dB 2.60dB	During T1: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +4.00dB $\hat{E}s_2 / N_{oc}$: -infinity During T2: N_{oc}: -98dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.60dB $\hat{E}s_2 / N_{oc}$: +6.60dB
8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	Same as 8.2.1	Same as 8.2.1	Same as 8.2.1
8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB
8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells	Same as 8.3.1	Same as 8.3.1	Sames as 8.3.1
8.3.3 E-UTRAN FDD-FDD Inter frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +4.00dB During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +24.00dB	During T1: +1.10dB 0dB 0dB 0dB During T2: +1.10dB -2.20dB 0dB 0dB	During T1: N_{oc1}: -96.90dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +4.00dB During T2: N_{oc1}: -96.90dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +1.80dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +24.00dB
8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB	During T1: 0dB 0dB 0dB 0dB During T2: 0dB 0dB 0dB 0dB	During T1: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: -infinity During T2: N_{oc1}: -98dBm/15kHz $\hat{E}s_1 / N_{oc1}$: +4.00dB N_{oc2}: -98dBm/15kHz $\hat{E}s_2 / N_{oc2}$: +7.00dB
8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	Same as 8.4.1	Same as 8.4.1	Same as 8.4.1

9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported RSRP values: ±6dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported RSRP values: ±8dB Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported RSRP values: ±6dB	Test 1: -0.7dB 0dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +0.8dB Via mapping	Test 1: N_{oc}: -106.7dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_29 to RSRP_43 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_45 to RSRP_64 Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -0.2dB RSRP_17 to RSRP_32 RSRP_19 to RSRP_34 RSRP_20 to RSRP_35 RSRP_18 to RSRP_33 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc} and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.1.2 FDD Intra Frequency Relative RSRP Accuracy	Test 1: N_{oc}: -106dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +1.0dB Reported relative RSRP values: ±3dB Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: -1.0dB Reported relative RSRP values: ±3dB	Test 1: 0 dB 0 dB +1.0dB Via mapping Test 2: 0dB 0dB +1.0dB Via mapping Test 3: 0dB 0dB +1.0dB Via mapping	Test 1: N_{oc}: -106 dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 2: N_{oc}: -88dBm/15kHz $\hat{E}s_1 / N_{oc}$: +6.0dB $\hat{E}s_2 / N_{oc}$: +2.0dB RSRP_x-9 to RSRP_x+1 Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc}$: +3.0dB $\hat{E}s_2 / N_{oc}$: 0dB RSRP_x-8 to RSRP_x+2
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc}, $\hat{E}s_1 / N_{oc}$ and $\hat{E}s_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Same as 9.1.1.1	Same as 9.1.1.1	Same as 9.1.1.1
9.1.2.2 TDD Intra Frequency Relative RSRP Accuracy	Same as 9.1.1.2	Same as 9.1.1.2	Same as 9.1.1.2

9.1.3.1 FDD Inter Frequency Absolute RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -88.65dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB Reported RSRP values: ±8dB Test 2: N_{oc1}: -109dBm or -107dBm or -106dBm or -108dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +14.00dB N_{oc2}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_2$ / N_{oc2}: -5.00dB Reported RSRP values: ±6dB	Test 1: -0.3dB 0dB -0.3dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -88.95dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10.00dB N_{oc2}: -88.95dBm/15kHz $\hat{E}s_2$ / N_{oc2}: +10.00dB RSRP_52 to RSRP_71 Test 2: N_{oc1}: -109dBm or -107dBm or -106dBm or -108dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +14.00dB N_{oc2}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_2$ / N_{oc}: -5.00dB RSRP_12 to RSRP_27 RSRP_14 to RSRP_29 RSRP_15 to RSRP_30 RSRP_13 to RSRP_28 depending on operating band
	The derivation of the RSRP values takes into account the uncertainty in Cell 2 RSRP from N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for normal conditions. In all cases the RSRP values are 3dB wider at each end for extreme conditions.		
9.1.3.2 FDD Inter Frequency Relative RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $\hat{E}s_1$ / N_{oc1}: +10dB $\hat{E}s_2$ / N_{oc2}: +10dB Reported relative RSRP values: ±6dB Test 2: N_{oc1}: -109dBm or -107dBm or -106dBm or -108dBm /15kHz depending on operating band N_{oc2}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +14dB $\hat{E}s_2$ / N_{oc2}: -5.0dB Reported relative RSRP values: ±6dB	Test 1: -0.3dB -0.3dB 0dB 0dB Via mapping Test 2: -1.1dB 0dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -88.95dBm/15kHz N_{oc2}: -88.95dBm/15kHz $\hat{E}s_1$ / N_{oc}: +10dB $\hat{E}s_2$ / N_{oc}: +10dB RSRP_(x-8) to RSRP_(x+8) Test 2: N_{oc1}: -110.1dBm or -108.1dBm or -107.1dBm or -109.1dBm /15kHz depending on operating band N_{oc2}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $\hat{E}s_1$ / N_{oc1}: +14dB $\hat{E}s_2$ / N_{oc2}: -5.0dB RSRP_(x-33) to RSRP_(x-18)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $\hat{E}s_1$ / N_{oc1} and N_{oc2} and $\hat{E}s_2$ / N_{oc2}, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.1.4.1 TDD Inter Frequency Absolute RSRP Accuracy	Same as 9.1.3.1	Same as 9.1.3.1	Same as 9.1.3.1

9.1.4.2 TDD Inter Frequency Relative RSRP Accuracy	Test 1: N_{oc1}: -88.65dBm/15kHz N_{oc2}: -88.65dBm/15kHz $Ês_1 / N_{oc1}$: +10dB $Ês_2 / N_{oc2}$: +10dB Reported relative RSRP values: ±6dB Test 2: N_{oc1}: -109dBm/15kHz N_{oc2}: -116dBm/15kHz $Ês_1 / N_{oc1}$: +14dB $Ês_2 / N_{oc2}$: -5.0dB Reported relative RSRP values: ±6dB	Test 1: -0.3dB -0.3dB 0dB 0dB Via mapping Test 2: -1.1dB 0dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -88.95dBm/15kHz N_{oc2}: -88.95dBm/15kHz $Ês_1 / N_{oc}$: +10dB $Ês_2 / N_{oc}$: +10dB RSRP_(x-8) to RSRP_(x+8) Test 2: N_{oc1}: -110.1dBm/15kHz N_{oc2}: -116dBm/15kHz $Ês_1 / N_{oc1}$: +14dB $Ês_2 / N_{oc2}$: -5.0dB RSRP_(x-33) to RSRP_(x-18)
	The derivation of the RSRP values takes into account the uncertainty in Cell 1 and Cell 2 RSRP from N_{oc1} and $Ês_1 / N_{oc1}$ and N_{oc2} and $Ês_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRP values given above are for both normal and extreme conditions.		
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	Test 1: N_{oc}: -84.76dBm/15kHz $Ês_1 / N_{oc}$: +3.0dB $Ês_2 / N_{oc}$: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $Ês_1 / N_{oc}$: -2.9dB $Ês_2 / N_{oc}$: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $Ês_1 / N_{oc}$: -4.0dB $Ês_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.51Bm/15kHz $Ês_1 / N_{oc}$: +3.0dB $Ês_2 / N_{oc}$: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $Ês_1 / N_{oc}$: -2.9dB $Ês_2 / N_{oc}$: -2.9dB RSRQ_00 to RSRP_14 Test 3: N_{oc}: -116dBm or -114dBm or -113dBm or -115dBm /15kHz depending on operating band $Ês_1 / N_{oc}$: -3.6dB $Ês_2 / N_{oc}$: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $Ês_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for tests 2 and 3 the RSRQ values are 0.5dB wider at each end for extreme conditions.		
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Test 1: N_{oc}: -84.76dBm/15kHz $Ês_1 / N_{oc}$: +3.0dB $Ês_2 / N_{oc}$: +3.0dB Reported RSRQ values: ±2.5dB Test 2: N_{oc}: -103.85dBm/15kHz $Ês_1 / N_{oc}$: -2.9dB $Ês_2 / N_{oc}$: -2.9dB Reported RSRQ values: ±3.5dB Test 3: N_{oc}: -116dBm/15kHz $Ês_1 / N_{oc}$: -4.0dB $Ês_2 / N_{oc}$: -4.0dB Reported RSRQ values: ±3.5dB	Test 1: -0.75dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB Via mapping Test 3: 0dB +0.4dB +0.4dB Via mapping	Test 1: N_{oc}: -85.51Bm/15kHz $Ês_1 / N_{oc}$: +3.0dB $Ês_2 / N_{oc}$: +3.0dB RSRQ_04 to RSRQ_16 Test 2: N_{oc}: -103.85dBm/15kHz $Ês_1 / N_{oc}$: -2.9dB $Ês_2 / N_{oc}$: -2.9dB RSRQ_00 to RSRP_14 Test 3: N_{oc}: -116dBm/15kHz $Ês_1 / N_{oc}$: -3.6dB $Ês_2 / N_{oc}$: -3.6dB RSRQ_00 to RSRQ_14
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc} and $Ês_2 / N_{oc}$, the allowed UE reporting accuracy, and the UE mapping function. The RSRQ values given above are for normal conditions. For test 1 the RSRQ values are 1.5dB wider at each end for extreme conditions, and for test 2 the RSRQ values are 0.5dB wider at each end for extreme conditions.		

9.2.3.1 FDD - FDD Inter Frequency Absolute RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported RSRQ values: ±2.5dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104dBm/15kHz N_{oc2}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4.7dB $\hat{E}s_2 / N_{o2c}$: -4.7dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions Test 3: N_{oc1}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band N_{oc2}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4.5dB $\hat{E}s_2 / N_{o2c}$: -4.5dB Reported RSRQ values: ±3.5dB for normal conditions and ±4dB for extreme conditions	Test 1: 0dB -0.8dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0dB Via mapping Test 3: 0dB 0dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80.8dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_04 to RSRQ_16 (NTC) RSRQ_01 to RSRQ_19 Test 2: N_{oc1}: -104dBm/15kHz N_{oc2}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4.7dB $\hat{E}s_2 / N_{o2c}$: -4.7dB RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC) Test 3: N_{oc1}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band N_{oc2}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4.5dB $\hat{E}s_2 / N_{o2c}$: -4.5dB RSRQ_00 to RSRQ_14 (NTC) RSRQ_00 to RSRQ_15 (ETC)
	The derivation of the RSRQ values takes into account the uncertainty in Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		
9.2.3.2 FDD - FDD Inter Frequency Relative RSRQ Accuracy	Test 1: N_{oc1}: -80dBm/15kHz N_{oc2}: -80dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB Reported Relative RSRQ values: ±3dB for normal conditions and ±4dB for extreme conditions Test 2: N_{oc1}: -104dBm/15kHz N_{oc2}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4.7dB $\hat{E}s_2 / N_{o2c}$: -4.7dB Reported Relative RSRQ values: ±4dB Test 3: N_{oc1}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band N_{oc2}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4.5dB $\hat{E}s_2 / N_{o2c}$: -4.5dB Reported Relative RSRQ values: ±4dB	Test 1: -0.8dB -0.8dB 0dB 0dB Via mapping Test 2: 0dB 0dB 0dB 0dB Via mapping Test 3: 0dB 0dB 0dB 0dB Via mapping	Test 1: N_{oc1}: -80.8dBm/15kHz N_{oc2}: -80.8dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -1.75dB $\hat{E}s_2 / N_{oc2}$: -1.75dB RSRQ_x - 8 to RSRQ_x + 8 (NTC) RSRQ_x - 10 to RSRQ_x + 10 (ETC) Test 2: N_{oc1}: -104dBm/15kHz N_{oc2}: -104dBm/15kHz $\hat{E}s_1 / N_{oc1}$: -4.7dB $\hat{E}s_2 / N_{o2c}$: -4.7dB RSRQ_x - 10 to RSRQ_x + 10 Test 3: N_{oc1}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band N_{oc2}: -119dBm or -117dBm or -116dBm or -118dBm /15kHz depending on operating band $\hat{E}s_1 / N_{oc1}$: -4.5dB $\hat{E}s_2 / N_{o2c}$: -4.5dB RSRQ_x - 10 to RSRQ_x + 10
	The derivation of the relative RSRQ values takes into account the uncertainty in Cell 1 RSRQ from N_{oc1} and $\hat{E}s_1 / N_{oc1}$ and Cell 2 RSRQ from N_{oc2} and $\hat{E}s_2 / N_{oc2}$, the allowed UE reporting accuracy, and the UE mapping function.		

9.2.4.1 TDD - TDD Inter Frequency Absolute RSRQ Accuracy	Same as 9.2.3.1		
9.2.4.2 TDD - TDD Inter Frequency Relative RSRQ Accuracy	Same as 9.2.3.2		

Annex G (normative): Statistical Testing

G.1 General

FSS

G.2 Statistical testing of delay and UE measurement performance in RRM tests

G.2.1 General

The RRM tests are either of deterministic or of statistical nature. The pass fail limits in tests of statistical nature are expressed as a limit (e.g. delay limit) and a success ratio applicable for the limit. The success ratio is 90% uniform (the complement is the error ratio ER = 10%).

G.2.2 Design of the test

The test is defined by the following design principles (see TS 36.521-1 clause G.X, Theory):

1) The early decision concept is applied.

2) A second limit is introduced: bad DUT factor M>1

To decide the test pass:

Supplier risk is applied based on the bad DUT quality

To decide the test fails

Customer risk is applied based on the specified DUT quality

The test is defined by the following parameters:

1) Limit ER = 0.1 (success ratio = 90%)

2) Bad DUT factor M=1.5 (selectivity)

3) Confidence level CL = 95% (for specified DUT and bad DUT-quality)

G.2.3 Numerical definition of the pass fail limits

Table G.2.3-1: pass fail limits

ne	ns_p	ns_f	ne	ns_p	ns_f	ne	ns_p	ns_f	ne	ns_p	ns_f
0	33	NA	43	408	283	86	737	644	129	1056	1021
1	46	NA	44	416	291	87	745	653	130	1064	1030
2	58	2	45	424	299	88	752	661	131	1071	1039
3	69	5	46	432	307	89	760	670	132	1078	1048
4	79	8	47	440	315	90	767	679	133	1086	1057
5	89	12	48	447	324	91	775	687	134	1093	1066
6	99	17	49	455	332	92	782	696	135	1100	1074
7	109	22	50	463	340	93	790	705	136	1108	1083
8	118	27	51	471	348	94	797	713	137	1115	1092
9	127	33	52	478	356	95	804	722	138	1122	1101
10	136	39	53	486	365	96	812	731	139	1130	1110
11	145	45	54	494	373	97	819	739	140	1137	1119
12	154	51	55	502	381	98	827	748	141	1144	1128
13	163	58	56	509	389	99	834	757	142	1152	1137
14	172	64	57	517	398	100	842	766	143	1159	1147
15	180	71	58	525	406	101	849	774	144	1166	1155
16	189	78	59	532	414	102	857	783	145	1174	1164
17	197	85	60	540	423	103	864	792	146	1181	1173
18	206	92	61	548	431	104	871	801	147	NA	1182
19	214	99	62	555	440	105	879	809	148		
20	223	106	63	563	448	106	886	818	149		
21	231	113	64	571	456	107	894	827	150		
22	239	120	65	578	465	108	901	836	151		
23	248	128	66	586	473	109	909	844	152		
24	256	135	67	594	482	110	916	853	153		
25	264	142	68	601	490	111	923	862	154		
26	272	150	69	609	499	112	931	871	155		
27	281	157	70	616	507	113	938	880	156		
28	289	165	71	624	516	114	946	888	157		
29	297	173	72	632	524	115	953	897	158		
30	305	180	73	639	533	116	960	906	159		
31	313	188	74	647	541	117	968	915	160		
32	321	196	75	654	550	118	975	924	161		
33	329	204	76	662	558	119	983	933	162		
34	337	211	77	669	567	120	990	941	163		
35	345	219	78	677	575	121	997	950	164		
36	353	227	79	684	584	122	1005	959	165		
37	361	235	80	692	592	123	1012	968	166		
38	369	243	81	700	601	124	1019	977	167		
39	377	251	82	707	610	125	1027	986	168		
40	385	259	83	715	618	126	1034	994	169		
41	393	267	84	722	627	127	1042	1003			
42	400	275	85	730	635	128	1049	1012			

The first column is the number of errors (ne = number of exceeded delays or number of wrong reports)

The second column is the number of samples for the pass limit (ns_p , ns=Number of samples= number of successes + number of exceedings or number of reports)

The third column is the number of samples for the fail limit (ns_f)

G.2.4 Pass fail decision rules

The pass fail decision rules apply for a single test, comprising one component in the test vector. The over all Pass /Fail conditions are defined in clause G.2.6

Having observed 0 errors, pass the test at 33+ samples, otherwise continue

Having observed 1 error, pass the test at 46+ samples, otherwise continue

Having observed 2 errors, pass the test at 58+ samples, fail the test at 2 samples, otherwise continue

Having observed 146 errors, pass the test at 1181+ samples, fail the test at 1173- samples, otherwise continue

Having observed 147 errors, fail the test at 1182- samples,

Where x+ means: x or more, x- means x or less

NOTE 1: an ideal DUT passes after 33 samples. The maximum test time is 1181 samples.

G.2.5 Void

G.2.6 Test conditions for delay tests and UE measurement performance

Table G.2.6-1: test conditions

Test	Statistical independence	Number of components in the test vector, as specified in the test requirements and initial conditions of the applicable test	-	Over all Pass/Fail condition
All tests in clauses 4, 5, 6.1, 7.2, 7.3 and 8 are delay tests of statistical nature while 6.2 and 7.1 are not applicable, since deterministic.	Test procedure in all statistical tests ensures independency	1 per operating band (if tested, see 3A.3.3)		Full set of environmental conditions (5) per operating band
All tests in clause 9 are UE level reports of statistical nature	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band		Full set of environmental conditions (5) per operating band

G.X Theory to derive the numbers in Table G.2.3-1 (Informative)

TS 36.521-1 Annex G.X applies

Annex H (normative): Default Message Contents

This annex contains the default values of common messages specific to RRM, other than those described in TS 36.508 [7]. The message contents shall apply to test cases accordingly and unless indicated otherwise in specific test cases, shall be transmitted and checked by the system simulator. The default message contents can be defined for FDD Mode, or TDD Mode or both FDD/TDD Modes. All the messages are listed in alphabetical order based on conformance tests.

NOTE: For example, test case 8.1.1 has an exception for RRCConnectionReconfiguration message and therefore uses message contents according to TS 36.508 [7] with the exception of the RRCConnectionReconfiguration message specified in Annex H.

H.1 Common contents of system information messages exceptions

This clause contains the default values of common system information messages, other than those described in TS 36.508 [7].

H.2 Common contents of system information blocks exceptions

This clause contains the default values of common system information blocks, other than those described in TS 36.508 [7].

H.2.1 System information blocks message contents exceptions for E-UTRAN intra frequency cell re-selection

SystemInformationBlockType3: (FDD/TDD) for E-UTRAN intra-frequency cell re-selection

Table H.2.1-1: *SystemInformationBlockType3*: E-UTRAN intra frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionInfoCommon SEQUENCE {			
q-Hyst	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	

SystemInformationBlockType4: (FDD/TDD) for E-UTRAN intra-frequency cell re-selection

For Cell 2

Table H.2.1-2: *SystemInformationBlockType4*: E-UTRAN intra frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType4			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighCellList SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
IntraFreqNeighCellInfo ::= SEQUENCE {			
intraFreqNeighCellInfo SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
physCellId	0 (Cell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			
}			

H.2.2 System information blocks message contents exceptions for E-UTRAN inter frequency cell re-selection

SystemInformationBlockType3: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection

Table H.2.2-1: *SystemInformationBlockType3*: E-UTRAN inter frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1	
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	4 for cell 1 5 for cell 2		

SystemInformationBlockType5: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection case

For Cell 1

Table H.2.2-2: *SystemInformationBlockType5*: E-UTRAN inter frequency cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
cellReselectionPriority[*n*]	5 for cell 1		
}			

For Cell 2

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
interFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
cellReselectionPriority[*n*]	4 for cell 2		
}			
interFreqNeighCellList[*n*] SEQUENCE (SIZE (1..maxCellInter)) OF SEQUENCE {			
physCellId	0 (Cell 1 Id)	INTEGER (0..503)	
q-OffsetCell	dB0 (0 dB)	0 is actual value in dB (0 * 2 dB)	
}			

H.2.3 System information blocks message contents exceptions for E-UTRAN inter-RAT cell re-selection

SystemInformationBlockType3: for inter-RAT EUTRAN FDD - UTRA FDD is of higher priority cell re-selection

Table H.2.3-1: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1 (E-UTRA)	
threshServingLow	18 (36 dB)	36 is actual value in dB (18* 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD - UTRA FDD is of higher priority cell re-selection

Table H.2.3-2: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD - UTRA FDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-High	20 (40 dB)	40 is actual value in dB (20 * 2 dB)	
q-RxLevMin	-58 (-115 dBm)	-115 is actual value in dBm (-58 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
q-QualMin	-20 (-20 dB)		
cellReselectionPriority[*n*]	5	UTRA is of higher priority than E-UTRAN	
}			

SystemInformationBlockType3: for inter-RAT EUTRAN TDD - UTRA TDD is of higher priority cell re-selection

Table H.2.3-3: *SystemInformationBlockType3*: Inter-RAT E-UTRAN TDD - UTRA TDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	25 (50 dB)	50 is actual value in dB (25 * 2 dB); for Cell 1 (E-UTRA)	
threshServingLow	12 (24 dB)	24 is actual value in dB (12* 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN TDD - UTRA TDD is of higher priority cell re-selection

Table H.2.3-4: *SystemInformationBlockType6*: Inter-RAT E-UTRAN TDD - UTRA TDD is of higher priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			UTRA-TDD
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
cellReselectionPriority[*n*]	5	UTRA is of higher priority than E-UTRAN	
}			

SystemInformationBlockType3: for inter-RAT EUTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Table H.2.3-5: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Table H.2.3-6: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA FDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
threshX-Low	21 (42 dB)	42 is actual value in dB (21 * 2 dB)	
q-RxLevMin	-58 (-115 dBm)	-115 is actual value in dBm (-58 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
q-QualMin	-20 (-20 dB)		
}			

SystemInformationBlockType3: for inter-RAT EUTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Table H.2.3-7: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	23 (46 dB)	46 is actual value in dB (23 * 2 dB)	

SystemInformationBlockType6: for inter-RAT EUTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Table H.2.3-8: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD/TDD - UTRA TDD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
CarrierFreqListUTRA-TDD ::= SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			UTRA-TDD
threshX-Low	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
}			

SystemInformationBlockType3: (FDD/TDD) for inter-RAT E-UTRAN - GSM cell re-selection

Table H.2.3-9: *SystemInformationBlockType3*: Inter-RAT E-UTRAN - GSM cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	Value/remark	Comment	Condition
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	4		

SystemInformationBlockType7: (FDD/TDD) for inter-RAT E-UTRAN - GSM cell re-selection

Table H.2.3-10: *SystemInformationBlockType7*: Inter-RAT E-UTRAN - GSM cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-6 SystemInformationBlockType7			
Information Element	Value/remark	Comment	Condition
commonInfo SEQUENCE {			
cellReselectionPriority	0		
ncc-Permitted	'11111111'B		
q-RxLevMin	5 (-105 dBm)	-105 is actual value in dBm (5 * 2 - 115 dBm)	
p-MaxGERAN	23 (23 dBm)		GSM 400 & GSM 900 & GSM 850 & GSM 700
	24 (24 dBm)		DCS 1800 & PCS 1900
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
threshX-Low	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	

SystemInformationBlockType3: Inter-RAT E-UTRAN FDD - HRPD is of lower priority cell re-selection

Table H.2.3-11: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD - HRPD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType3			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionServingFreqInfo SEQUENCE {			
s-NonIntraSearch	Not sent		
threshServingLow	22 (44 dB)	44 is actual value in dB (22 * 2 dB)	
cellReselectionPriority	1		
}			
intraFreqCellReselectionInfo SEQUENCE {			
q-RxLevMin	-70 (-140 dBm)	For RF/RRM test cases	
s-IntraSearch	Not present		
t-ReselectionEUTRA	0		

SystemInformationBlockType8: Inter-RAT E-UTRAN FDD - HRPD is of lower priority cell re-selection

Table H.2.3-12: *SystemInformationBlockType8*: Inter-RAT E-UTRAN FDD - HRPD is of lower priority cell re-selection

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-7 SystemInformationBlockType8			
Information Element	**Value/remark**	**Comment**	**Condition**
cellReselectionParametersHRPD SEQUENCE {			
bandClassList SEQUENCE (SIZE (1..maxCDMA -BandClass)) OF SEQUENCE {	1 entry		
cellReselectionPriority	0		
threshX-High	60(-30)	INTEGER (0..63)	
threshX-Low	28(-14)	INTEGER (0..63)	
}			
}			
t-ReselectionCDMA2000	0	INTEGER (0..7)	
}			

H.2.4 System information blocks message contents exceptions for E-UTRAN radio link monitoring (RLM)

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Radio Link Monitoring test for out-of-sync

Table H.2.4-1: *SystemInformationBlockType2*: E-UTRAN Radio Link Monitoring test for out-of-sync

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t300	ms1000		
t301	ms1000		
t310	ms0		
n310	n1		
t311	ms1000		
n311	n1		

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Radio Link Monitoring test for in-sync

Table H.2.4-2: *SystemInformationBlockType2*: E-UTRAN Radio Link Monitoring test for in-sync

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-2 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t300	ms1000		
t301	ms1000		
t310	ms2000		
n310	n1		
t311	ms1000		
n311	n1		

H.2.5 System information blocks message contents exceptions for RRC Re-establishment

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Intra-frequency RRC Re-establishment

Table H.2.5-1: *SystemInformationBlockType2*: E-UTRAN FDD Intra-frequency RRC Re-establishment

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t310	ms0		
t311	ms3000		
n310	n1		
n311	n1		

SystemInformationBlockType2: (FDD/TDD) for E-UTRAN Inter-frequency RRC Re-establishment

Table H.2.5-2: *SystemInformationBlockType2*: E-UTRAN FDD Inter-frequency RRC Re-establishment

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1 SystemInformationBlockType2			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType 2 ::= SEQUENCE {			
ue-TimersAndConstants {			
t310	ms0		
t311	ms5000		
n310	n1		
n311	n1		

H.3 Default RRC messages and information elements contents exceptions

This clause contains the default values of common sRRC messages and information elements, other than those described in TS 36.508 [7].

H.3.1 RRC messages and information elements contents exceptions for E-UTRAN measurement configuration

RRCConnectionReconfiguration: (FDD/TDD) to setup E-UTRAN Measurement Configuration

Table H.3.1-1: *RRCConnectionReconfiguration*: E-UTRAN Measurement Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
measConfig			
}	MeasConfig -DEFAULT		MEAS
}			
}			
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurment configuration for intra frequency measurment

Table H.3.1-2: *MeasConfig-DEFAULT*: E-UTRAN intra frequency measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		

}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurment configuration for inter frequency measurment

Table H.3.1-3: *MeasConfig-DEFAULT*: E-UTRAN inter frequency measurement configuration

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)	inter frequency	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-A3		
reportConfig	ReportConfigEUTRA-A3		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-A3		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurment configuration for E-UTRAN to UTRAN cell search

Table H.3.1-4: *MeasConfig-DEFAULT*: interRAT UTRAN measurement configuration for E-UTRAN to UTRAN cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurment configuration for E-UTRAN to UTRAN handover

Table H.3.1-5: *MeasConfig-DEFAULT*: interRAT UTRAN measurement configuration for E-UTRAN to UTRAN handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f8		
measObject CHOICE {			
measObjectUTRA	MeasObjectUTRA-GENERIC(f8)	UTRA Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-UTRA		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f8		
reportConfigId	IdReportConfig-B2		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig-DEFAULT (FDD/TDD) E-UTRAN measurment configuration for E-UTRAN to GSM cell search

Table H.3.1-6: *MeasConfig-DEFAULT*: interRAT GSM measurement configuration for E-UTRAN to GSM cell search

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f13		
measObject CHOICE {			
measObjectGERAN	MeasObjectGERAN-GENERIC(f13)	GERAN Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B1		
reportConfig	ReportConfigInterRAT-B1-GERAN		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f13		
reportConfigId	idReportConfig-B1		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

QuantityConfig-DEFAULT (FDD/TDD) E-UTRAN measurment configuration for L3 filtering is not used

Table H.3.1-7: QuantityConfig-DEFAULT: measurment configuration for L3 filtering is not used

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-3A: QuantityConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
QuantityConfig-DEFAULT ::= SEQUENCE {			
quantityConfigEUTRA SEQUENCE {			
filterCoefficientRSRP	fc0		
filterCoefficientRSRQ	fc0		
}			
quantityConfigUTRA SEQUENCE {}	Not present		
quantityConfigUTRA SEQUENCE {			UTRAN
measQuantityUTRA-FDD	cpich-EcN0		
measQuantityUTRA-TDD	pccpch-RSCP		
filterCoefficient	fc0		
}			
quantityConfigGERAN SEQUENCE {}	Not present		
quantityConfigGERAN SEQUENCE {			GERAN
measQuantityGERAN	rssi		
filterCoefficient	fc0		
}			
quantityConfigCDMA2000 SEQUENCE {}	Not present		
quantityConfigCDMA2000 SEQUENCE {			CDMA2000
measQuantityCDMA2000	pilotStrength		
}			
}			

Condition	Explanation
UTRAN	For inter-RAT measurements with UTRAN
GERAN	For inter-RAT measurements with GERAN
CDMA2000	For inter-RAT measurements with CDMA2000

Table H.3.1-8: *MeasConfig-DEFAULT*: interRAT HRPD measurement configuration for E-UTRAN to HRPD handover

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT:			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1		
measObject CHOICE {			
measObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)	E-UTRA Cell	
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f14		
measObject CHOICE {			
measObjectCDMA2000	MeasObjectCDMA2000-GENERIC(f14)	CDMA2000 Cell	
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId)) OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-B2		
reportConfig	ReportConfigInterRAT-B2-CDMA2000		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) OF SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f14		
reportConfigId	IdReportConfig-B2		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN – HRPD handover

Table H.3.3-4: *Handover*: Inter-RAT E-UTRAN – HRPD handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	cdma2000-HRPD	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	

H.3.2 RRC messages and information elements contents exceptions for E-UTRAN cell re-selection and handover

PRACH-ConfCommonDEFAULT: (FDD) for cell re-selection and handover

Table H.3.2-1: *PRACH-ConfCommonDEFAULT*: E-UTRAN FDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-ConfCommonDEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigInfo SEQUENCE {			
prach-ConfigIndex	4		

PRACH-ConfCommonDEFAULT: (TDD) for cell re-selection and intra frequency / inter frequency handover

Table H.3.2-2: *PRACH-ConfCommonDEFAULT*: E-UTRAN TDD cell re-selection and handover

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-7 PRACH-ConfCommonDEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PRACH-ConfigInfo SEQUENCE {			
prach-ConfigIndex	53		

H.3.3 RRC messages and information elements contents exceptions for E-UTRAN inter-RAT handover

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN - UTRAN handover

Table H.3.3-1: *Handover*: Inter-RAT E-UTRAN - UTRAN handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	utra	ENUMERATED {utra, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	

Handover: (FDD/TDD) to perform Inter-RAT E-UTRAN - GSM handover

Table H.3.3-2: *Handover*: Inter-RAT E-UTRAN - GSM handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	Value/remark	Comment	Condition
Handover ::= SEQUENCE {			
targetRAT-Type	geran	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	

MobilityFromEUTRACommand: (FDD/TDD) to setup Inter-RAT E-UTRAN handover

Table H.3.3-3: *MobilityFromEUTRACommand*: Inter-RAT E-UTRAN handover

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-6 MobilityFromEUTRACommand			
Information Element	**Value/remark**	**Comment**	**Condition**
MobilityFromEUTRACommand ::= SEQUENCE {			
rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
c1 CHOICE {			
mobilityFromEUTRACommand-r8 SEQUENCE {			
csFallbackIndicator	Not present		
purpose CHOICE {			
Handover	Handover		
}			
nonCriticalExtension SEQUENCE {}	Not present		
}			
}			
}			
}			

H.3.4 RRC messages and information elements exceptions for E-UTRAN UE transmit timing accuracy and UE timing advance adjustment accuracy

RRCConnectionReconfiguration: (FDD/TDD) to establish E-UTRAN Radio Resource Configuration

Table H.3.4-1: *RRCConnectionReconfiguration*: E-UTRAN Radio Resource Configuration

Derivation Path: TS 36.508 [7] clause 4.6.1, Table 4.6.1-8 RRCConnectionReconfiguration			
Information Element	**Value/remark**	**Comment**	**Condition**
RRCConnectionReconfiguration ::= SEQUENCE {			
Rrc-TransactionIdentifier	RRC-TransactionIdentifier-DL		
criticalExtensions CHOICE {			
C1 CHOICE{			
rrcConnectionReconfiguration-r8 SEQUENCE {			
radioResourceConfigDedicated			
	RadioResourceConfigDedicated-HO-TO-EUTRA(n,m)		HO-TO-EUTRA(n,m)

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) for E-UTRAN Physical Configuration

Table H.3.4-2: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN Physical Configuration

Derivation Path: TS 36.508 [7] clause 4.8.21.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRS-UL-ConfigDedicated			SRB1
	SoundingRS-UL-ConfigDedicated-DEFAULT		RBC
antennaInformation CHOICE {			
defaultValue	NULL		
}			
schedulingRequestConfig	Not present		SRB1

H.3.5 RRC messages and information elements contents exceptions for E-UTRAN RSRP and RSRQ Accuracy

MeasConfig: (FDD/TDD) to perform Measurement Configuration for E-UTRAN intra frequency RSRP and RSRQ accuracy

Table H.3.5-1: *MeasConfig-DEFAULT*: E-UTRAN intra frequency RSRP and RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	1 entry		
measObjectId	IdMeasObject-f1	f 1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {			
measId	1		
measObjectId	IdMeasObject-f1		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	Not present		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

MeasConfig: (FDD/TDD) perform Measurement Configuration for E-UTRAN inter frequency RSRP and RSRQ accuracy

Table H.3.5-2: *MeasConfig-DEFAULT*: E-UTRAN inter frequency RSRP and RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasConfig-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList SEQUENCE (SIZE (1..maxObjectId)) OF SEQUENCE {	2 entry		
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f1	f 1 is the frequency of the serving cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f1)		
}			
}			
MeasObjectToAddMod SEQUENCE {			
measObjectId	IdMeasObject-f2	f 2 is the frequency of the neighbouring cell	
measObject CHOICE {			
MeasObjectEUTRA	MeasObjectEUTRA-GENERIC(f2)		
}			
}			
}			
reportConfigToRemoveList	Not present		
reportConfigToAddModList SEQUENCE (SIZE (1..maxReportConfigId))OF SEQUENCE {	1 entry		
reportConfigId	idReportConfig-P		
reportConfig	ReportConfigEUTRA-PERIODICAL		
}			
measIdToRemoveList	Not present		
measIdToAddModList SEQUENCE (SIZE (1..maxMeasId)) of SEQUENCE {	1 entry		
measId	1		
measObjectId	IdMeasObject-f2		
reportConfigId	idReportConfig-P		
}			
quantityConfig	QuantityConfig-DEFAULT		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRP accuracy

Table H.3.5-3: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRP Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrp		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

ReportConfigEUTRA-PEROIDICAL: (FDD/TDD) for periodical configuration reporting of E-UTRAN RSRQ accuracy

Table H.3.5-4: *ReportConfigEUTRA-PERIODICAL*: E-UTRAN RSRQ Accuracy

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-7 ReportConfigEUTRA-PERIODICAL			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose	reportStrongestCells		
}			
}			
triggerQuantity	rsrq		
reportQuantity	sameAsTriggerQuantity		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

H.3.6 RRC messages and information elements contents exceptions for E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency handover and E-UTRAN intra-frequency cell search with DRX_S

Table H.3.6-1: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_S

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_S
Release	NULL		
setup SEQUENCE {			
onDurationTimer	psf2		
drx-InactivityTimer	psf100		
drx-RetransmissionTimer	sf16		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for best-effort services.	
sf40	0		
}			
shortDRX	Not present		
}			
}			

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency handover and E-UTRAN intra-frequency cell search with DRX_L

Table H.3.6-2: *MAC-MainConfig-RBC*: E-UTRAN inter frequency handover and E-UTRAN intra frequency cell search with DRX_L

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			DRX_L
Release	NULL		
Setup SEQUENCE {			
onDurationTimer	psf6		
drx-InactivityTimer	psf1920		
drx-RetransmissionTimer	sf16		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	0		
}			
shortDRX	Not present		
}			
}			

H.3.7 RRC messages and information elements contents exceptions for E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX is used

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search when DRX = 40 ms

Table H.3.7-1: *MAC-MainConfig-RBC*: E-UTRAN inter frequency cell search and E-UTRAN intra frequency cell search when DRX = 40 ms

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Release	NULL		
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
sf40	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		

MAC-MainConfig-RBC: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search when DRX = 1280 ms

Table H.3.7-2: *MAC-MainConfig-RBC*: E-UTRAN inter frequency and E-UTRAN inter-RAT cell search when DRX = 1280 ms

Derivation Path: TS 36.508 [7] clause 4.8.2.1.5, Table 4.8.2.1.6-1 MAC-MainConfig-RBC			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfig-RBC ::= SEQUENCE {			
ul-SCH-Config SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Config CHOICE {			
Release	NULL		
Setup SEQUENCE {			
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	sf1		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
sf1280	9	To avoid overlapping with measurement gap.	
}			
shortDRX	Not present		
}			
}			
timeAlignmentTimerDedicated	sf500		

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) to perform DRX Configuration for E-UTRAN - inter-frequency and E-UTRAN inter-RAT cell search

Table H.3.7-3: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN inter frequency and E-UTRAN inter-RAT cell search

Derivation Path: TS 36.508 [7] clause 4.8.2.1.6, Table 4.8.2.1.6-1 PhysicalConfigDedicated-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
…			
schedulingRequestConfig	SchedulingRequest-Config-DEFAULT		
}			

Annex I: Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2008-06	RAN5#39bis	R5-082129			R5-082129: Restructure of TS 36.521-1 and RRM proposal (Split of RRM from 36.521-1 v0.2.0 in its own specification 36.521-3 v0.1.0)		0.1.0
2008-06	*RAN5#39bis*	*R5-082174*			Following approved TPs have been included: R5-082129: Restructure of TS 36.521-1 and RRM proposal (Split of RRM from 36.521-1 v0.2.0 in its own specification 36.521-3 v0.1.0) R5-082160: Cover for LTE E-UTRAN RRC_IDLE State Mobility text proposal R5-082161: Cover for LTE E-UTRAN RRC_CONNECTED State Mobility text proposal R5-082162: Update of 36.521-1: Introduction of HRPD and CDMA2000 in RRM test cases R5-082163: Cover for LTE UE Transmit Timing Requirements text proposal Editorial changes for Annexes	*0.1.0*	*0.2.0*
2008-08	RAN5#40	R5-083164			Following approved TPs have been included: R5-083051: LTE E-UTRAN RRC_IDLE State Mobility text proposal R5-083052: LTE E-UTRAN RRC_CONNECTED State Mobility text proposal R5-083053: LTE UE Transmit Timing Requirements text proposal R5-083054: LTE UE Measurement Procedures text proposal R5-083813: LTE UE Measurement Performance Requirements text proposal R5-083138: Text proposal for LTE E-UTRAN Cell Re-selection to HRPD or to cdma2000 1xRTT in TS 36.521-3 R5-083056: RRC Connection Mobility Control text proposal R5-083164: LTE-RF 36-521-3 after RAN5#40 Editorial restructuring to section 4	0.2.0	0.3.0
2008-10	RAN5#40Bis	R5-084073			Following approved TPs have been included: R5-084073: TS 36.521-3 after RAN5#40Bis R5-084079: LTE Cell Re-Selection text proposal R5-084322: LTE FDD/FDD Handover for intra/inter frequency text proposal	0.3.0	0.4.0
2008-11	RAN5#41	R5-085084			Following approved TPs have been included: R5-085084 LTE-RF: TS 36.521-3 after RAN5#41 R5-085718 LTE RRM Cell Re-Selection text proposal R5-085719 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-085720 E-UTRAN FDD intra-frequency measurements text proposal R5-085740 RSRQ Accuracy Measurement Performance Requirements text proposal R5-085722 Text Proposal for Cell Configuration mapping annex in 36.521-3 Editor's cleanup	0.4.0	0.5.0
2009-01	RAN5#41Bis	R5-086067			Following approved TPs have been included: R5-086067 LTE-RF: TS 36.521-3 after RAN5#41Bis R5-086149 References to connection diagrams R5-086418 LTE RRM Cell Re-Selection text proposal R5-086095 Cell configuration reference correction for RRM tests in 36.521-3 section 3A.3 R5-086419 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-086420 E-UTRAN FDD intra-frequency measurements text proposal R5-086431 RSRQ Accuracy Measurement Performance Requirements text proposal R5-086082 LTE UE Transmit Timing Requirements text proposal R5-086422 Text proposal for RSRP measurement accuracy test cases R5-086432 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal	0.5.0	0.6.0

					R5-086142 Measurement Reference Channels and OCNG for RRM testing R5-086150 Statistical testing in RRM tests Editor's cleanup		
2009-03	RAN5#42	R5-090191			Following approved TPs have been included: R5-091026 TDD Intra frequency RSRQ Accuracy R5-091085 TDD Inter frequency RSRQ Accuracy R5-091035 LTE RRM FDD/FDD Handover for intra/inter frequency text proposal R5-091047 E-UTRAN FDD intra-frequency measurements text proposal R5-091029 RSTQ Accuracy Measurement Performance Requirements text proposal R5-091041 LTE RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-091040 LTE RRM E-UTRA FDD to GSM Handover text proposal R5-090182 LTE UE Measurement Procedures Structure text proposal R5-091048 LTE RRM E-UTRA FDD to UTRA FDD Cell Search text proposal R5-090184 LTE UE inter-RAT Handover Structure text proposal R5-091039 LTE RRM E-UTRA FDD to UTRA FDD Handover text proposal R5-091053 LTE UE Transmit Timing Requirements text proposal R5-090191 LTE-RF: TS 36.521-3 after RAN5#42 R5-091091 Intra-frequency cell search TDD R5-091088 Intra-frequency Absolute RSRP measurement accuracy TDD R5-091090 Intra-frequency Relative RSRP measurement accuracy TDD R5-091089 Inter-frequency RSRP absolute accuracy TDD R5-091087 Inter-frequency RSRP relative accuracy TDD R5-091028 Text Proposal for RSRP Measurement Accuracy test cases R5-091076 Text Proposal for Annex C of TS 36.521-3 R5-091051 TP of E-UTRAN TDD & GSM cell re-selection test case R5-091043 TP of E-UTRAN TDD & TDD inter frequency cell re-selection test case R5-091036 TP of E-UTRAN TDD & TDD inter frequency handover test case R5-091044 TP of E-UTRAN TDD - TDD intra frequency cell re-selection test case R5-091038 TP of E-UTRAN TDD & TDD intra frequency handover test case R5-091045 TP of E-UTRAN TDD & UTRAN TDD cell re-selection test case R5-091049 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-091050 E-UTRAN TDD- TDD Inter-Frequency Measurements text proposal R5-091052 LTE-RF: Update to 36.521-3 Annex E Cell Configuration mapping R5-091064 Correction to frequencies to be tested in RRM test cases R5-091042 LTE RRM Cell Re-Selection text proposal Editor's cleanup	0.6.0	1.0.0
2009-03	RAN5#42Bis				R5-091263 LTE-RRM Cell Re-Selection text proposal R5-091922 LTE-RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-091923 LTE-RRM E-UTRA FDD - UTRA TDD Cell Re-Selection text proposal R5-091924 TP of E-UTRA TDD - GSM cell reselection R5-091945 TP of E-UTRA TDD-UTRAN TDD cell re-selection : UTRA is of higher priority R5-091926 TP of E-UTRA TDD - UTRA TDD cell reselection: UTRA is of lower priority test case R5-091264 LTE-RRM FDD/FDD Handover for intra/inter frequency text proposal R5-091931 LTE-RRM E-UTRA FDD to GSM Handover text proposal R5-091928 LTE-RRM E-UTRA FDD to UTRA FDD Handover text proposal	1.0.0	1.1.0

					R5-091946 LTE-RRM: E-UTRA TDD to UTRA FDD Handover text proposal R5-091947 LTE-RRM: Handover test proposal R5-091930 TP of E-UTRA TDD to UTRA TDD handover test case R5-091265 LTE-RRM E-UTRAN FDD intra-frequency measurements text proposal R5-091266 LTE-RRM RSRQ Accuracy Measurement Performance Requirements text proposal R5-091932 LTE-RRM E-UTRA FDD to UTRA FDD Cell Search (fading) text proposal R5-091933 LTE-RRM E-UTRAN FDD & UE Transmit Timing Accuracy text proposal R5-091276 LTE-RRM E-UTRAN FDD & UE Timing Advance Adjustment Accuracy text proposal R5-091934 LTE-RRM: E-UTRA TDD to UTRA FDD Cell Search (fading) text proposal R5-091935 LTE-RRM E-UTRAN TDD & UE Transmit Timing Accuracy text proposal R5-091936 LTE-RRM E-UTRAN TDD & UE Timing Advance Adjustment Accuracy text proposal R5-091937 LTE-RRM E-UTRA FDD to UTRA TDD Cell Search (fading) text proposal R5-091381 EUTRAN TDD to UTRAN TDD cell search (fading) R5-091386 LTE RRM TDD Inter Frequency RSRP Accuracy text proposal R5-091398 Text Proposal for RSRP Measurement Accuracy test cases R5-091948 LTE-RRM: Measurements test proposal R5-091431 RRM-EUTRAN FDD RLM test for out-of-sync R5-091434 RRM-EUTRAN TDD RLM test for out-of-sync R5-091435 RRM-EUTRAN FDD RLM test for In-sync R5-091436 RRM-EUTRAN TDD RLM test for In-sync R5-091468 RRM E-UTRAN FDD-FDD Inter-frequency Measurements R5-091469 RRM E-UTRAN TDD-TDD Inter-frequency Measurements R5-091939 LTE-RRM cell configuration mapping updates R5-091407 Update of statistical requirements to 36.521-3 Editor's cleanup		
2009-05	RAN5#43	R5-092156			R5-092156 LTE-RF: TS 36.521-3 after RAN5#43 R5-092066 E-UTRAN FDD- FDD Inter-Frequency Measurements text proposal R5-092617 RRM E-UTRAN TDD-TDD Inter-frequency Measurement R5-092068 RRM-EUTRAN FDD RLM test for out-of-sync and in-synch R5-092069 RRM-EUTRAN TDD RLM test for out-of-sync and in-synch R5-092071 Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas R5-092127 Update of statistical requirements to 36.521-3 R5-092630 LTE RRM: 1→2 RX antenna R5-092618 Text Proposal for E-UTRAN FDD-UTRAN FDD cell re-selection test cases R5-092651 Text Proposal for E-UTRAN FDD - GSM Measurements test case R5-092620 LTE-RRM E-UTRA TDD to GSM event triggered reporting in AWGN text proposal R5-092360 LTE RRM TDD Inter Frequency RSRP Accuracy text proposal R5-092621 LTE-RRM Default Message Contents for support of RRM text proposal R5-092384 LTE-RRM Update of Message Contents for E-UTRAN FDD RRM tests to align with support of RRM text proposal R5-092622 LTE-RRM E-UTRAN FDD Cell Re-Selection text proposal R5-092386 LTE-RRM FDD Inter Frequency RSRQ Accuracy Measurement Performance Requirements text proposal R5-092387 LTE-RRM E-UTRA FDD to GSM Cell Re-Selection text proposal R5-092623 LTE-RRM E-UTRAN FDD intra frequency cell search (fading) in long DRX text proposal R5-092624 LTE-RRM E-UTRAN FDD intra frequency cell search (fading) in short DRX text proposal R5-092390 LTE-RRM E-UTRAN FDD - UE Transmit Timing	1.1.0	2.0.0

					Accuracy text proposal R5-092626 LTE-RRM E-UTRAN FDD random access: contention based scenario text proposal R5-092627 LTE-RRM E-UTRAN FDD random access: non-contention based scenario text proposal R5-092628 LTE-RRM E-UTRA FDD to HRPD Handover text proposal R5-092629 LTE-RRM E-UTRA FDD to cdma2000 1xRTT Handover text proposal R5-092443 Addition of band 18 and 19 to LTE RRM test cases Editor's cleanup		
2009-05	RAN#44	-	-		Updated to v8.0.0 after RAN#44 with no technical change.	2.0.0	8.0.0
2009-06	-	-	-		Editorial clean up	8.0.0	8.0.1
2009-09	RAN#45	R5-094036	0001	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN (FDD) cell re-selection tests	8.0.1	8.1.0
2009-09	RAN#45	R5-094037	0002	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - FDD Inter Frequency Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094038	0003	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - FDD Intra Frequency Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094039	0004	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UE transmit timing accuracy test	8.0.1	8.1.0
2009-09	RAN#45	R5-094040	0005	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM cell re-selection test	8.0.1	8.1.0
2009-09	RAN#45	R5-094041	0006	-	Correction CR to 36.521-3: Update of Requirements conditions for E-UTRAN FDD - UE timing advance adjustment accuracy test	8.0.1	8.1.0
2009-09	RAN#45	R5-094042	0007	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094043	0008	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD Handover test	8.0.1	8.1.0
2009-09	RAN#45	R5-094045	0009	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - GSM Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094047	0010	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - Contention Based Random Access test	8.0.1	8.1.0
2009-09	RAN#45	R5-094048	0011	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - Non-Contention Based Random Access test	8.0.1	8.1.0
2009-09	RAN#45	R5-094049	0012	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD-FDD Inter-frequency cell search when DRX is used under fading propagation conditions	8.0.1	8.1.0
2009-09	RAN#45	R5-094050	0013	-	Correction CR to 36.521-3: Update of E-UTRAN FDD-FDD Intra-frequency cell search when DRX is used under fading propagation conditions	8.0.1	8.1.0
2009-09	RAN#45	R5-094051	0014	-	Correction CR to 36.521-3: Update of Annex H Default Message Contents for support of RRM	8.0.1	8.1.0
2009-09	RAN#45	R5-094217	0015	-	Update for E-UTRA FDD - UTRA TDD cell reselection	8.0.1	8.1.0
2009-09	RAN#45	R5-094218	0016	-	Test proposal for E-UTRA FDD - UTRA TDD HO	8.0.1	8.1.0
2009-09	RAN#45	R5-094219	0017	-	Test proposal for E-UTRA TDD random access: contention based scenario	8.0.1	8.1.0
2009-09	RAN#45	R5-094220	0018	-	Test proposal for E-UTRA TDD random access: non-contention based scenario	8.0.1	8.1.0
2009-09	RAN#45	R5-094221	0019	-	Update for TDD Intra-frequency RSRQ measurement accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094222	0020	-	Update for TDD Inter-frequency RSRQ measurement accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094223	0021	-	Update for E-UTRAN TDD Transmit timing accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094225	0022	-	Update for E-UTRA FDD - UTRA TDD cell search(fading)	8.0.1	8.1.0
2009-09	RAN#45	R5-094253	0023	-	CR to 36.521-3: Addition of E-UTRAN FDD Intra-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094254	0024	-	CR to 36.521-3: Addition of E-UTRAN FDD Inter-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094285	0025	-	LTE-RRM: Introduction of Common Exception messages table for E-UTRAN TDD-UTRAN FDD handover and E-UTRAN TDD-UTRAN FDD measurements	8.0.1	8.1.0
2009-09	RAN#45	R5-094358	0026	-	Correction to RSRP measurement accuracy test cases	8.0.1	8.1.0
2009-09	RAN#45	R5-094442	0027	-	CR to 36.521-3: Update of E-UTRA FDD to HRPD Handover and E-UTRA FDD to cdma2000 1xRTT Handover test cases	8.0.1	8.1.0
2009-09	RAN#45	R5-094709	0028	-	LTE RRM: Correction to test cases 4.4.1 and 4.4.2	8.0.1	8.1.0
2009-09	RAN#45	R5-094713	0029	-	Resubmission - Update to E-UTRAN to HRPD Cell Re-Selection (HRPD is of lower priority) test case	8.0.1	8.1.0
2009-09	RAN#45	R5-094720	0030	-	Resubmission - Update to E-UTRAN to CDMA2000 1xRTT Cell Re-Selection (CDMA2000 1xRTT is of lower priority) test case	8.0.1	8.1.0
2009-09	RAN#45	R5-094743	0031	-	RRM TCs in test mode	8.0.1	8.1.0
2009-09	RAN#45	R5-094927	0032	-	Correction CR to 36.521-3: Update of inter-frequency E-UTRAN TDD-TDD cell re-selection 4.2.6	8.0.1	8.1.0
2009-09	RAN#45	R5-094928	0033	-	Correction CR to 36.521-3: Update of E-UTRAN TDD -	8.0.1	8.1.0

					UTRAN TDD cell re-selection 4.3.4		
2009-09	RAN#45	R5-094929	0034	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD cell re-selection test	8.0.1	8.1.0
2009-09	RAN#45	R5-094930	0035	-	LTE-RRM:Addition of common messages to Annex H	8.0.1	8.1.0
2009-09	RAN#45	R5-094931	0036	-	Test Proposal for E-UTRAN TDD Intra-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094932	0037	-	Test Proposal for E-UTRAN TDD Inter-frequency RRC Re-establishment	8.0.1	8.1.0
2009-09	RAN#45	R5-094933	0038	-	Update for E-UTRAN TDD Timing advanced adjustment accuracy	8.0.1	8.1.0
2009-09	RAN#45	R5-094934	0039	-	Correction CR to 36.521-3: Update of Requirements for E-UTRAN FDD - UTRAN FDD Cell Search test	8.0.1	8.1.0
2009-09	RAN#45	R5-094935	0040	-	E-UTRA TDD - TDD Intra frequency cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094936	0041	-	TDD - TDD RSRP measurement	8.0.1	8.1.0
2009-09	RAN#45	R5-094937	0042	-	Update 8.10.1 E-UTRAN TDD-GSM event triggered reporting in AWGN	8.0.1	8.1.0
2009-09	RAN#45	R5-094938	0043	-	Add new tc 8.10.2 EUTRAN TDD-GSM cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094939	0044	-	Add new tc 8.7.2 EUTRAN TDD - UTRAN TDD cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094940	0045	-	E-UTRA TDD - TDD Inter frequency cell search with DRX	8.0.1	8.1.0
2009-09	RAN#45	R5-094942	0046	-	Update to Annex E Cell Configuration Mapping	8.0.1	8.1.0
2009-09	RAN#45	R5-094967	0047	-	RRM Radio Link Monitoring FDD update	8.0.1	8.1.0
2009-09	RAN#45	R5-094968	0048	-	RRM Radio Link Monitoring TDD update	8.0.1	8.1.0
2009-09	RAN#45	R5-094969	0050	-	RRM: E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting	8.0.1	8.1.0
2009-09	RAN#45	R5-094970	0051	-	CR to 36.521-3:Message updates for RSRP and RSRQ Accuracy measurement	8.0.1	8.1.0
2009-09	RAN#45	R5-094971	0052	-	RRM OCNG and RMC update	8.0.1	8.1.0
2009-09	RAN#45	R5-094972	0053	-	RRM:Update of Annex E for SON	8.0.1	8.1.0
2009-12	RAN#46	R5-095492	0054	-	Removal of test state 4 in RRM test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-095493	0055	-	CR to 36.521-3 Annexes of E-UTRAN cell reselection test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-095499	0056	-	CR for E-UTRAN FDD - UTRAN TDD handover	8.1.0	8.2.0
2009-12	RAN#46	R5-095501	0057	-	CR for E-UTRAN TDD - UE Transmit Timing Accuracy	8.1.0	8.2.0
2009-12	RAN#46	R5-095503	0058	-	CR for E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095504	0059	-	Correction to TDD RSRP and RSRQ measurement requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-095527	0060	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD cell re-selection intra frequency case and inter frequency case conformance minimum requirements updates	8.1.0	8.2.0
2009-12	RAN#46	R5-095528	0061	-	Correction CR to 36.521-3: E-UTRAN FDD - UTRAN FDD cell re-selection: UTRA FDD is of higher priority and UTRA FDD is of lower priority conformance minimum requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-095529	0062	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency event triggered reporting under fading propagation conditions in asynchronous cells case	8.1.0	8.2.0
2009-12	RAN#46	R5-095530	0063	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency event triggered reporting when DRX is used under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095531	0064	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Intra Frequency event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095537	0065	-	Correction CR to 36.521-3: E-UTRAN FDD - UE Transmit Timing Accuracy case	8.1.0	8.2.0
2009-12	RAN#46	R5-095538	0066	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD inter frequency event triggered reporting when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-095557	0067	-	Correction CR to 36.521-3: General RRM Updates	8.1.0	8.2.0
2009-12	RAN#46	R5-095572	0068	-	Update TC 8.7.2 E-UTRAN TDD - UTRAN TDD cell search when DRX is used under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-095573	0069	-	Update TC 8.10.2 E-UTRAN TDD - GSM event triggered reporting when DRX is used in AWGN	8.1.0	8.2.0
2009-12	RAN#46	R5-095576	0070	-	Update TC 8.2.1 E-UTRAN TDD - TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	8.1.0	8.2.0
2009-12	RAN#46	R5-095591	0071	-	update of Annex H.2.3 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-095741	0072	-	CR to the inconsistent expression in UE Measurements Procedures	8.1.0	8.2.0
2009-12	RAN#46	R5-095917	0073	-	Update: Radio Link Monitoring test cases: no DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096145	0074	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Inter Frequency Absolute RSRP Accuracy case	8.1.0	8.2.0
2009-12	RAN#46	R5-096243	0075	-	Update to RRM TC:E-UTRAN FDD - UTRAN TDD cell re-selection	8.1.0	8.2.0
2009-12	RAN#46	R5-096244	0104	1	Addition of new TC to 36.521-3: E-UTRAN TDD - UTRAN FDD	8.1.0	8.2.0

					cell re-selection test		
2009-12	RAN#46	R5-096246	0105	-	Modification of section 4.2.2 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-096247	0106	-	Modification of section 4.2.2 in 36.521-3	8.1.0	8.2.0
2009-12	RAN#46	R5-096255	0076	-	CR to the RA response window's name in Random Access conformance requirements	8.1.0	8.2.0
2009-12	RAN#46	R5-096257	0077	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD cell re-selection in fading propagation conditions: UTRA FDD is of lower priority	8.1.0	8.2.0
2009-12	RAN#46	R5-096258	0078	1	Addition of new TC to 36.521-3:E-UTRAN TDD - GSM Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096263	0079	1	Add new TC 5.1.6 E-UTRAN TDD - TDD inter frequency handover: unknown target cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096265	0080	-	CR to 36.521-3: Update of E-UTRA FDD to HRPD Handover and E-UTRA FDD to cdma2000 1xRTT Handover test cases	8.1.0	8.2.0
2009-12	RAN#46	R5-096267	0081	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - GSM Cell Search when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096268	0082	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD Cell Search when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096269	0083	-	RRM:Update of test case 8.4.1 TDD inter-frequency event triggered reporting	8.1.0	8.2.0
2009-12	RAN#46	R5-096271	0084	-	LTE-RF: Update to Annex E Cell Configuration Mapping	8.1.0	8.2.0
2009-12	RAN#46	R5-096272	0085	-	Correction CR to 36.521-3: Addition of message contents exceptions for E-UTRAN inter frequency and inter-RAT Cell Search for when DRX is used	8.1.0	8.2.0
2009-12	RAN#46	R5-096273	0086	-	Correction CR to 36.521-3: E-UTRAN FDD - UTRA FDD Handover case	8.1.0	8.2.0
2009-12	RAN#46	R5-096274	0087	-	CR to 36.521-3: Update to FDD Intra-frequency RRC Re-establishment test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096275	0088	-	CR to 36.521-3: Update to FDD Inter-frequency RRC Re-establishment test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096276	0107	-	Test Case of E-UTRAN TDD to GSM Handover	8.1.0	8.2.0
2009-12	RAN#46	R5-096296	0089	-	Update TC 8.7.1 E-UTRAN TDD - UTRAN TDD event triggered reporting under fading propagation conditions	8.1.0	8.2.0
2009-12	RAN#46	R5-096302	0090	-	Correction CR to 36.521-3: E-UTRAN FDD - GSM event triggered reporting in AWGN case	8.1.0	8.2.0
2009-12	RAN#46	R5-096303	0091	-	Addition of new TC to 36.521-3: E-UTRAN TDD to E-UTRAN TDD and UTRA TDD cell search test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096310	0092	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - UTRAN FDD Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096324	0093	-	Addition of new TC to 36.521-3 E-UTRAN TDD - UTRAN TDD HO test: unknown target cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096325	0094	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - FDD inter frequency Handover test cases: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096326	0095	-	Addition of test scenario CR to 36.521-3: E-UTRAN FDD - GSM Handover: Unknown Target Cell	8.1.0	8.2.0
2009-12	RAN#46	R5-096327	0096	-	Addition of new TC to 36.521-3: E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions test case	8.1.0	8.2.0
2009-12	RAN#46	R5-096328	0097	-	E-UTRAN FDD Radio Link Monitoring test for Out-of-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096329	0098	-	E-UTRAN FDD Radio Link Monitoring test for in-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096330	0099	-	E-UTRAN TDD Radio Link Monitoring test for Out-of-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096331	0100	-	E-UTRAN TDD Radio Link Monitoring test for in-sync in DRX	8.1.0	8.2.0
2009-12	RAN#46	R5-096332	0101	-	RRM:Update of test case 8.3.1 FDD inter-frequency event triggered reporting	8.1.0	8.2.0
2009-12	RAN#46	R5-096337	0102	-	Correction CR to 36.521-3: E-UTRAN FDD - FDD Handover intra frequency and inter frequency case	8.1.0	8.2.0
2009-12	RAN#46	R5-096340	0103	-	Introduction of uncertainties for RRM test cases 4.2.1 and 4.2.2	8.1.0	8.2.0
2010-03	RAN#47	R5-100130	0108	-	Test Tolerances and alignment with 36.133 for cell re-selection intra frequency cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100132	0109	-	Uncertainties and Test Tolerances for inter frequency cell re-selection	8.2.0	8.3.0
2010-03	RAN#47	R5-100135	0110	-	Clarification of Extreme conditions for RSRP test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100362	0113	-	CR about the Cell Search Requirements for LTE FDD-FDD/ TDD-TDD Handover to Unknown Target Cell	8.2.0	8.3.0
2010-03	RAN#47	R5-100365	0114	-	CR on updating the handover delay requirements for E-UTRAN TDD - TDD both intra-frequency and inter-frequency handovers	8.2.0	8.3.0
2010-03	RAN#47	R5-100367	0115	-	CR to correct the test requirements of reselection from E-UTRAN FDD/TDD to UTRAN TDD	8.2.0	8.3.0
2010-03	RAN#47	R5-100394	0116	-	Correction of Annex H about measurement performance	8.2.0	8.3.0

					messages		
2010-03	RAN#47	R5-100401	0117	-	RRM Inter frequency cell search updates, TC 8.3.1 and 8.4.1	8.2.0	8.3.0
2010-03	RAN#47	R5-100438	0118	-	Update TC 8.7.1, 8.9.1 and 8.11.4	8.2.0	8.3.0
2010-03	RAN#47	R5-100460	0119	-	Misc update on 521-3	8.2.0	8.3.0
2010-03	RAN#47	R5-100486	0120	-	CR to 36.521-3: Addition of E-UTRA FDD to HRPD Handover: Unknown Target Cell and E-UTRA FDD to cdma2000 1xRTT Handover: Unknown Target Cell test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100519	0121	-	Correction to RSRP Accuracy test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100546	0122	-	CR to 36.521-3: Update to E-UTRAN FDD RRC Re-establishment test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100562	0123	-	CR to 36.521-3: Update LTE RRM test cases with test requirements for extended LTE1500	8.2.0	8.3.0
2010-03	RAN#47	R5-100714	0124	-	Addition of missing Es/Noc parameters in RRM test cases	8.2.0	8.3.0
2010-03	RAN#47	R5-100715	0125	-	Correction to GSM measurement configuration in Annex H.3.1	8.2.0	8.3.0
2010-03	RAN#47	R5-100716	0126	-	Update on Annex C for 36.521-3	8.2.0	8.3.0
2010-03	RAN#47	R5-100849	0127	-	Text on exclusion of extra delay due to RRC retransmission	8.2.0	8.3.0
2010-03	RAN#47	R5-100850	0128	-	Correction to test iteration procedure in cell re-selection TCs	8.2.0	8.3.0
2010-03	RAN#47	R5-100852	0129	-	DL Mac Padding for RRM TCs	8.2.0	8.3.0
2010-03	RAN#47	R5-100853	0130	-	Update TC 5.1.6 E-UTRAN TDD-TDD inter frequency handover unknown target cell	8.2.0	8.3.0
2010-03	RAN#47	R5-100854	0131	-	New RRM test case, 8.7.3 E-UTRAN TDD SON ANR	8.2.0	8.3.0
2010-03	RAN#47	R5-100859	0132	-	Update TC 8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX	8.2.0	8.3.0
2010-03	RAN#47	R5-100860	0133	-	Update TC 8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100861	0134	-	Update TC 8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100862	0135	-	Misc update on test applicability	8.2.0	8.3.0
2010-03	RAN#47	R5-100865	0136	-	CR about corrections of PDSCH Reference Measurement Channels	8.2.0	8.3.0
2010-03	RAN#47	R5-100866	0137	-	CR about OFDMA Channel Noise Generator (OCNG)	8.2.0	8.3.0
2010-03	RAN#47	R5-100873	0138	-	CR to 36.521-3 Rel-8 Introduction of E-UTRAN FDD - FDD Intra Frequency Cell Search with DRX when L3 filtering is used	8.2.0	8.3.0
2010-03	RAN#47	R5-100890	0139	-	Update to RRM TC: TDD Intra frequency RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100896	0140	-	Clarification on Time offset between cells	8.2.0	8.3.0
2010-03	RAN#47	R5-100897	0141	-	Update to RRM TC:E-UTRAN TDD-TDD cell re-selection	8.2.0	8.3.0
2010-03	RAN#47	R5-100898	0142	-	Update to RRM TC: TDD Inter frequency RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100900	0143	-	Uncertainties and Test Tolerances for FDD Intra Frequency Absolute RSRP Accuracy	8.2.0	8.3.0
2010-03	RAN#47	R5-100901	0144	-	RRM TTIdcch and cell timing change, update of chapter 8	8.2.0	8.3.0
2010-03	RAN#47	-	-	-	Moved to v9.0.0 with no change	8.3.0	9.0.0
2010-06	RAN#48	R5-103105	0145	-	CR to 36.521-3: Update RSRP test cases with band 11 and 21	9.0.0	9.1.0
2010-06	RAN#48	R5-103116	0146	-	Correction of CR conflict for Intra Frequency TDD reselection test	9.0.0	9.1.0
2010-06	RAN#48	R5-103117	0147	-	Reference to TR 36.903 in TS 36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103312	0149	-	Connection diagram for test 8.11.2 (3 cells)	9.0.0	9.1.0
2010-06	RAN#48	R5-103315	0150	-	Correction to connection diagram reference for test 8.10.1 and 8.10.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103330	0151	-	update on test applicability	9.0.0	9.1.0
2010-06	RAN#48	R5-103358	0152	-	Annex E update	9.0.0	9.1.0
2010-06	RAN#48	R5-103496	0153	-	LTE-RRM:Update of test procedure for measurement performance test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103526	0154	-	CR 36.521-3 on corrections to requirements in Idle Mode	9.0.0	9.1.0
2010-06	RAN#48	R5-103528	0155	-	CR 36.521-3 on correction to InterRAT handover minimum requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103531	0156	-	CR 36.521-3 on correction to measurement requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103532	0157	-	CR 36.521-3 on correction to E-UTRA inter frequency cell search requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103534	0158	-	CR 36.521-3 on correction to UE transmit timing minimum and test requirements	9.0.0	9.1.0
2010-06	RAN#48	R5-103541	0159	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD HO inter-frequency case	9.0.0	9.1.0
2010-06	RAN#48	R5-103546	0160	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD intra frequency cell search under fading in asynchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103547	0161	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD-FDD intra frequency cell search under fading in synchronous cells	9.0.0	9.1.0
2010-06	RAN#48	R5-103548	0162	-	Addition of test tolerances and system uncertainties for E-	9.0.0	9.1.0

					UTRAN TDD-TDD intra frequency cell search under fading in synchronous cells		
2010-06	RAN#48	R5-103607	0163	-	Correction to step of physical cell identity change in 4.2.3	9.0.0	9.1.0
2010-06	RAN#48	R5-103608	0164	-	Correction of test mode reference to 36.508	9.0.0	9.1.0
2010-06	RAN#48	R5-103611	0165	-	Correction to the references of exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103612	0166	-	Correction to b2-Threshold1 in the exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103613	0194	-	Correction to Radio Resource Configuration in UE transmit timing and UE timing advance TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103614	0195	-	Correction to Gap Pattern Id in the exceptional message	9.0.0	9.1.0
2010-06	RAN#48	R5-103615	0196	-	Correction to Measure object and ID in the exceptional messages	9.0.0	9.1.0
2010-06	RAN#48	R5-103658	0197	-	Iteration in cell reselection tests	9.0.0	9.1.0
2010-06	RAN#48	R5-103709	0167	-	Connection diagram reference for intra-freq measurement TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103724	0168	-	LTE-RRM:CR to E-UTRAN TDD RRC Re-establishment test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103734	0169	-	Test Tolerances and alignment for RLM FDD TC 7.3.1, 7.3.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103736	0170	-	Uncertainties and Test Tolerances for Inter Frequency Absolute RSRP Accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103737	0171	-	Uncertainties and Test Tolerances for TC 8.1.3 and 8.2.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103738	0172	-	Uncertainties and Test Tolerances for TC 8.4.1 and 8.4.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103739	0173	-	LTE-RRM: CR for Test Tolerances of intra-freq hand over test cases (5.1.1 & 5.1.2)	9.0.0	9.1.0
2010-06	RAN#48	R5-103740	0174	-	LTE-RRM:CR for Test Tolerances of inter-freq absolute RSRQ accuracy test cases (9.2.3.1 & 9.2.4.1)	9.0.0	9.1.0
2010-06	RAN#48	R5-103741	0175	-	LTE-RRM:CR for Test Tolerances of inter-freq relative RSRQ accuracy test cases (9.2.3.2 & 9.2.4.2)	9.0.0	9.1.0
2010-06	RAN#48	R5-103742	0176	-	Uncertainties and Test Tolerances for Inter Frequency Relative RSRP Accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103743	0177	-	LTE-RRM: CR on Test Tolerances for TDD intra-freq absolute RSRP accuracy Test	9.0.0	9.1.0
2010-06	RAN#48	R5-103744	0178	-	LTE-RRM: CR on Test Tolerances for TDD intra-freq relative RSRP accuracy Test case	9.0.0	9.1.0
2010-06	RAN#48	R5-103745	0179	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD-TDD HO inter-frequency case	9.0.0	9.1.0
2010-06	RAN#48	R5-103746	0180	-	Additions to measurement uncertainties and Test Tolerances for E-UTRAN FDD-FDD and TDD-TDD HO inter-frequency case in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103747	0181	-	Additions to measurement uncertainties and Test Tolerances for E-UTRAN FDD-FDD and TDD-TDD intra frequency cell search in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103748	0182	-	Addition of test tolerances and system uncertainties for FDD intra frequency absolute RSRQ accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103749	0183	-	Addition of test tolerances and system uncertainties for TDD intra frequency absolute RSRQ accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103750	0184	-	Additions to measurement uncertainties and Test Tolerances for FDD and TDD intra frequency absolute RSRQ accuracy in Annex F	9.0.0	9.1.0
2010-06	RAN#48	R5-103758	0185	-	CR on 36.521-3 for corrections of missing Es/Noc parameters in RRM test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103759	0186	-	Adding new test case 8.11.5 Combined E-UTRAN - EUTRAN FDD and GSM cell search	9.0.0	9.1.0
2010-06	RAN#48	R5-103760	0187	-	Adding new test case 8.11.6 Combined E-UTRAN - EUTRAN TDD and GSM cell search.	9.0.0	9.1.0
2010-06	RAN#48	R5-103761	0188	-	Adding test case 8.7.3, 8.11.5, 8.11.6 to Annex E Cell configuration mapping.	9.0.0	9.1.0
2010-06	RAN#48	R5-103769	0189	-	Adding band 20, 800MHz in EU to TS36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103773	0190	-	Iteration in Handover and Re-establishment test cases	9.0.0	9.1.0
2010-06	RAN#48	R5-103779	0191	-	LTE-RRM:Addition of new TC E-UTRAN FDD -UTRAN FDD CPICH Ec/No absolute accuracy	9.0.0	9.1.0
2010-06	RAN#48	R5-103783	0192	-	Correction to q-RxLevMin for E-UTRAN - GSM cell re-selection	9.0.0	9.1.0
2010-06	RAN#48	R5-103784	0145	-	DL Mac Padding for RRM TCs	9.0.0	9.1.0
2010-06	RAN#48	R5-103105	0146	-	CR to 36.521-3: Update RSRP test cases with band 11 and 21	9.0.0	9.1.0
2010-06	RAN#48	R5-103116	0147	-	Correction of CR conflict for Intra Frequency TDD reselection test	9.0.0	9.1.0
2010-06	RAN#48	R5-103117	0201	-	Reference to TR 36.903 in TS 36.521-3	9.0.0	9.1.0
2010-06	RAN#48	R5-103229n	0149	-	Removal of technical content in 36.521-3 v8.3.0 and substitution with pointer to the next Release	9.0.0	9.1.0
2010-06	RAN#48	R5-103312	0150	-	Connection diagram for test 8.11.2 (3 cells)	9.0.0	9.1.0
2010-06	RAN#48	R5-103315	0151	-	Correction to connection diagram reference for test 8.10.1 and 8.10.2	9.0.0	9.1.0
2010-06	RAN#48	R5-103330	0152	-	update on test applicability	9.0.0	9.1.0
2010-06	RAN#48	R5-103358	0153	-	Annex E update	9.0.0	9.1.0
2010-09	RAN#49	R5-104098	0198	-	PUSCH Scheduling for RRM tests	9.1.0	9.2.0

2010-09	RAN#49	R5-104103	0199	-	Delay exclusion for retransmissions in RRM test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104108	0200	-	Expiry of contention resolution timer in Contention based PRACH test	9.1.0	9.2.0
2010-09	RAN#49	R5-104160	0201	-	Uncertainties and Test Tolerances for FDD Intra Frequency Relative RSRP Accuracy section 9.1.1.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104230	0202	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD cell re-selection intra frequency case 4.2.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104231	0203	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD cell re-selection inter frequency case 4.2.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104232	0204	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD Handover intra frequency case 5.1.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104233	0205	-	Correction CR to 36.521-3: Update of E-UTRAN TDD-TDD Handover inter frequency case 5.1.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104247	0206	-	Addition of Cell Configuration Mapping for Cell Search Test	9.1.0	9.2.0
2010-09	RAN#49	R5-104248	0207	-	CR to 36.521-3 on Correction to cell search	9.1.0	9.2.0
2010-09	RAN#49	R5-104249	0208	-	CR to 36.521-3 on Correction to UE Measurement Procedures	9.1.0	9.2.0
2010-09	RAN#49	R5-104250	0209	-	CR to 36.521-3 on Correction to RRM Cell Search	9.1.0	9.2.0
2010-09	RAN#49	R5-104251	0210	-	CR to 36.521-3 on Correction to RRM General	9.1.0	9.2.0
2010-09	RAN#49	R5-104260	0211	-	Addition of test tolerances and system uncertainties for E-UTRAN FDD random access tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104261	0212	-	Addition of test tolerances and system uncertainties for E-UTRAN TDD random access tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104262	0213	-	LTE-RRM: Addition of new TC E-UTRAN TDD -UTRAN FDD CPICH Ec/No absolute accuracy	9.1.0	9.2.0
2010-09	RAN#49	R5-104263	0214	-	LTE-RRM: Addition of new TC E-UTRAN TDD -UTRAN FDD CPICH RSCP absolute accuracy	9.1.0	9.2.0
2010-09	RAN#49	R5-104451	0215	-	Test Tolerances and alignment for RLM FDD TC 7.3.3, 7.3.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104452	0216	-	Test Tolerances and alignment for RLM FDD TC 7.3.5, 7.3.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104453	0217	-	Test Tolerances and alignment for RLM TDD TC 7.3.7, 7.3.8	9.1.0	9.2.0
2010-09	RAN#49	R5-104456	0218	-	Uncertainties and Test Tolerances for E-UTRAN FDD Intra-frequency RRC Re-establishment	9.1.0	9.2.0
2010-09	RAN#49	R5-104460	0219	-	Uncertainties and Test Tolerances for E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions	9.1.0	9.2.0
2010-09	RAN#49	R5-104497	0220	-	Clarification on the neighbour cell info	9.1.0	9.2.0
2010-09	RAN#49	R5-104498	0221	-	Addition of the exceptional message to UE Transmit Timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104499	0222	-	Maintenance on exceptional messages for annneta info	9.1.0	9.2.0
2010-09	RAN#49	R5-104500	0223	-	Correction to 6.1.1 and 6.1.2 of RRC Re-establishment test case	9.1.0	9.2.0
2010-09	RAN#49	R5-104501	0224	-	Maintenance on exceptional messages for Mobility Control Info	9.1.0	9.2.0
2010-09	RAN#49	R5-104521	0225	-	36521-3 General update of sections 00 to 07: missing Introduction references formatting	9.1.0	9.2.0
2010-09	RAN#49	R5-104563	0226	-	Update on exclusion of extra delay due to RRC retransmission	9.1.0	9.2.0
2010-09	RAN#49	R5-104616	0227	-	36.521-3 Correction to test procedure in 8.11.5 and 8.11.6 test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104625	0228	-	E-UTRAN TDD inter-frequency reselection test	9.1.0	9.2.0
2010-09	RAN#49	R5-104650	0229	-	Clarifications of test requirements in measurement accuracy tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104663	0230	-	36.521-3: Annex B and Annex C update	9.1.0	9.2.0
2010-09	RAN#49	R5-104825	0231	-	Missing cell Identity change step for test cases with unknown cell 2 timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104826	0232	-	Addition of test tolerances and system uncertainties for FDD timing characteristics tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104827	0233	-	Addition of test tolerances and system uncertainties for TDD timing characteristics tests	9.1.0	9.2.0
2010-09	RAN#49	R5-104828	0234	-	Additions to measurement uncertainties and test tolerances for timing characteristics tests in annex F	9.1.0	9.2.0
2010-09	RAN#49	R5-104829	0235	-	Uncertainties and Test Tolerances for E-UTRAN FDD Inter-frequency RRC Re-establishment	9.1.0	9.2.0
2010-09	RAN#49	R5-104830	0236	-	Uncertainties and Test Tolerances for E-UTRAN TDD-TDD inter-frequency Handover with unknown target cell	9.1.0	9.2.0
2010-09	RAN#49	R5-104839	0237	-	36521-3: Editorial update of sections 08	9.1.0	9.2.0
2010-09	RAN#49	R5-104849	0238	-	Maintenance on the exceptional messages in Ch8 - Annex	9.1.0	9.2.0
2010-09	RAN#49	R5-104855	0239	-	Uncertainties, Test Tolerances and Test Requirements for UE Transmit Timing	9.1.0	9.2.0
2010-09	RAN#49	R5-104856	0240	-	GSM carrier RSSI measurement accuracy in E-UTRAN TDD	9.1.0	9.2.0
2010-09	RAN#49	R5-104859	0241	-	E-UTRAN_to_UTRAN_FDD_reselection	9.1.0	9.2.0
2010-09	RAN#49	R5-104864	0242	-	Applicability of RRM inter-frequency test cases to (narrow) frequency bands	9.1.0	9.2.0
2010-09	RAN#49	R5-104865	0243	-	Maintenance on the exceptional messages in Ch5 - Ch6	9.1.0	9.2.0
2010-09	RAN#49	R5-104866	0244	-	36.521-3: Annex E update	9.1.0	9.2.0
2010-09	RAN#49	R5-104880	0245	-	Correction to E-UTRAN to UTRAN Cell Re-Selection test case	9.1.0	9.2.0

2010-09	RAN#49	R5-104881	0246	-	Redundant information in RRM Random Access Test Requirements	9.1.0	9.2.0
2010-09	RAN#49	R5-104883	0247	-	E-UTRAN TDD to UTRAN FDD Handover	9.1.0	9.2.0
2010-09	RAN#49	R5-104885	0248	-	Cell ID change time and iteration procedure for RRM test cases 4.2.1, 4.2.2	9.1.0	9.2.0
2010-09	RAN#49	R5-104886	0249	-	Cell ID change time for RRM test cases 4.2.3, 4.2.6	9.1.0	9.2.0
2010-09	RAN#49	R5-104887	0250	-	Scrambling code change time for RRM test cases 4.3.1.1, 4.3.4.1, 8.5.2, 8.7.3, 8.11.4	9.1.0	9.2.0
2010-09	RAN#49	R5-104889	0251	-	Iteration procedure for handover and re-establishment test cases	9.1.0	9.2.0
2010-09	RAN#49	R5-104890	0252	-	Correction to cell re-selection inter frequency test case	9.1.0	9.2.0
2010-09	RAN#49	R5-105057	0253	-	Clarification of Radio link monitoring test cases	9.1.0	9.2.0
2010-09	RAN#49	RP-100941	0254	-	Correction of status for RRM test cases and missing information in Annex	9.1.0	9.2.0
-	-	-	-	-	Re-insertion of the ambiguous step 11 of cl. 5.2.2.4.2 according to R5-104825 after email discussion	9.2.0	9.2.1
2010-12	RAN#50	R5-106079	0255	-	HARQ delay exclusion for HO test: Clarification for UE-DTX-case	9.2.1	9.3.0
2010-12	RAN#50	R5-106080	0256	-	Iteration procedure for inter RAT handover test cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106082	0257	-	Corrections to event triggered measurement tests using DRX (Clause 8)	9.2.1	9.3.0
2010-12	RAN#50	R5-106083	0258	-	Missing titles in the RRM specification	9.2.1	9.3.0
2010-12	RAN#50	R5-106085	0259	-	Scheduling of System information for RRM tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106086	0260	-	Update of PDCCH aggregation level for channel BW 1,4 MHz	9.2.1	9.3.0
2010-12	RAN#50	R5-106119	0261	-	CR to 36.521-3: Update LTE RRM test requirements for EUTRA TDD LTE band 41.	9.2.1	9.3.0
2010-12	RAN#50	R5-106313	0262	-	Uncertainties and Test Tolerances for Connected State Mobility test	9.2.1	9.3.0
2010-12	RAN#50	R5-106314	0263	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Test in Annex	9.2.1	9.3.0
2010-12	RAN#50	R5-106318	0264	-	Correction to inter-RAT Connected State Mobility test setup	9.2.1	9.3.0
2010-12	RAN#50	R5-106320	0265	-	Correction to Inter-RAT Connected State Mobility test requirements	9.2.1	9.3.0
2010-12	RAN#50	R5-106321	0266	-	Correction to Inter-RAT Connected State Mobility for Alignment	9.2.1	9.3.0
2010-12	RAN#50	R5-106322	0267	-	Correction to Inter-RAT Connected State Mobility test requirements	9.2.1	9.3.0
2010-12	RAN#50	R5-106448	0268	-	Addition of SIB7 exceptional messages	9.2.1	9.3.0
2010-12	RAN#50	R5-106451	0269	-	Correction to UE transmit timing TC	9.2.1	9.3.0
2010-12	RAN#50	R5-106455	0270	-	Correction to the exceptional messages in RSRQ tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106456	0271	-	Correction to Min Test time for RRM fading tests	9.2.1	9.3.0
2010-12	RAN#50	R5-106483	0272	-	Annex E update	9.2.1	9.3.0
2010-12	RAN#50	R5-106493	0273	-	CR to 36.521-3: Update to G.2.6 Test Conditions for Delay Tests and UE Measurement Performance	9.2.1	9.3.0
2010-12	RAN#50	R5-106805	0274	-	Correction to test case 5.1.2 - Update of E-UTRAN TDD-TDD Handover intra frequency case	9.2.1	9.3.0
2010-12	RAN#50	R5-106806	0275	-	Correction to test case 5.1.4 - Update of E-UTRAN TDD-TDD Handover inter frequency case	9.2.1	9.3.0
2010-12	RAN#50	R5-106807	0276	-	Correction to Inter-RAT UE Measurements Procedures	9.2.1	9.3.0
2010-12	RAN#50	R5-106808	0277	-	Correction to Inter-RAT UE Measurements Procedures under fading	9.2.1	9.3.0
2010-12	RAN#50	R5-106810	0278	-	Correction to test case 8.2.1	9.2.1	9.3.0
2010-12	RAN#50	R5-106811	0279	-	Correction to test case 8.2.2	9.2.1	9.3.0
2010-12	RAN#50	R5-106812	0295	-	Update of RRM OCNG patterns	9.2.1	9.3.0
2010-12	RAN#50	R5-106829	0280	-	General Corrections to RRC_IDLE State Mobility	9.2.1	9.3.0
2010-12	RAN#50	R5-106830	0281	-	Correction to test case 6.2.3	9.2.1	9.3.0
2010-12	RAN#50	R5-106831	0282	-	Correction to test case 6.2.4	9.2.1	9.3.0
2010-12	RAN#50	R5-106832	0283	-	Correction to MeasConfig-DEFAULT in RRM TCs	9.2.1	9.3.0
2010-12	RAN#50	R5-106833	0284	-	Adding support of inter-band test configuration for RRM inter-frequency/inter-RAT test cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106834	0285	-	CR on UEs RRM Band applicability	9.2.1	9.3.0
2010-12	RAN#50	R5-106835	0286	-	Correction to test case 7.1.2	9.2.1	9.3.0
2010-12	RAN#50	R5-106836	0287	-	Correction to test case 9.1.2.1, 9.1.2.2 and 9.2.2.1	9.2.1	9.3.0
2010-12	RAN#50	R5-106840	0288	-	Update to Radio Link Monitoring Test Cases	9.2.1	9.3.0
2010-12	RAN#50	R5-106857	0291	-	Correction to DL configuration on Non-Contention Based Random Access Test	9.2.1	9.3.0
2010-12	RAN#50	R5-106859	0292	-	Corrections to UE transmit timing tests (Subclause 7.3)	9.2.1	9.3.0
2010-12	RAN#50	R5-106862	0293	-	Correction to DL configuration on Contention Based Random Access Test	9.2.1	9.3.0
2010-12	RAN#50	R5-106864	0294	-	Update of Annex G for RLM test in DRX	9.2.1	9.3.0
2010-12	RAN#50	R5-106870	0289	-	Uncertainties and Test Tolerances for UE measurements procedures test	9.2.1	9.3.0
2010-12	RAN#50	R5-106871	0290	-	Addition to Measurement Uncertainties and Test Tolerances	9.2.1	9.3.0

					for UE Measurement Procedures test in Annex		
2011-03	RAN#51	R5-110150	0296	-	RRC Re-establishment tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110151	0297	-	Radio link monitoring tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110155	0298	-	UE Measurements Procedures tests: Test loop	9.3.0	9.4.0
2011-03	RAN#51	R5-110167	0299	-	Removal of [ ] from PDSCH and PCFICH/PDCCH/PHICH Measurement Channel references	9.3.0	9.4.0
2011-03	RAN#51	R5-110348	0300	-	Revision of 36.521-3 Annex G - Statistical testing	9.3.0	9.4.0
2011-03	RAN#51	R5-110418	0301	-	Correction to TDD cell re-selection	9.3.0	9.4.0
2011-03	RAN#51	R5-110419	0302	-	Correction to exception messages in 4.5.1 HRPD Re selection test	9.3.0	9.4.0
2011-03	RAN#51	R5-110424	0303	-	Alignment of exception messages for TDD event triggered measurement tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110435	0304	-	Modification of message content definition for TC 8.4.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110437	0305	-	Update to TC 8.6.1: E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110438	0306	-	Correction to TC 8.7.1: E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110443	0307	-	Update to TC 8.8.1: E-UTRAN FDD - GSM event triggered reporting in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110445	0308	-	Corrections to TC 8.9.1: E-UTRAN FDD - UTRAN TDD event triggered reporting under fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110520	0309	-	Correction to Inter-RAT Connected State Mobility for Alignment	9.3.0	9.4.0
2011-03	RAN#51	R5-110546	0310	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to UTRAN test	9.3.0	9.4.0
2011-03	RAN#51	R5-110549	0312	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM unknown test	9.3.0	9.4.0
2011-03	RAN#51	R5-110584	0314	-	Correction to gap pattern ID in test case 5.1.4	9.3.0	9.4.0
2011-03	RAN#51	R5-110586	0315	-	Clarification to 1.4 MHz testing and applicacbility in test case 7.1.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110588	0316	-	Test time limit correction for DRX=40ms in test case 8.1.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110863	0330	-	Higher SNR on event triggered measurement tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110866	0311	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to UTRAN test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110868	0313	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM unknown test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110902	0317	-	CR to 36.521-3: Update LTE RRM test requirements for EUTRA TDD LTE band 41	9.3.0	9.4.0
2011-03	RAN#51	R5-110903	0318	-	Correction to exception messages in 5.3.1 HRPD HHO test	9.3.0	9.4.0
2011-03	RAN#51	R5-110904	0319	-	MIMO Correlation scenario for RLM test cases	9.3.0	9.4.0
2011-03	RAN#51	R5-110905	0320	-	Enabling HARQ for section 8 and 9 RRM Tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110907	0321	-	Re-ordering of Time periods, definition of uncertainties, and addition of Test Tolerances for RRM test case 4.3.1.1	9.3.0	9.4.0
2011-03	RAN#51	R5-110910	0322	-	Updated Test Tolerances for RRM Test cases 7.1.1 + 7.1.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110911	0323	-	Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM tests	9.3.0	9.4.0
2011-03	RAN#51	R5-110912	0324	-	Addition to Measurement Uncertainties and Test Tolerances for Connected State Mobility Inter-RAT to GSM test in Annex	9.3.0	9.4.0
2011-03	RAN#51	R5-110927	0325	-	Corrections to RRM TC 8.1.1, 8.1.2 and 8.1.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110928	0326	-	Corrections to test cases about E-UTRAN FDD-FDD Inter-frequency measurement 8.3.1, 8.3.2 and 8.3.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110929	0327	-	Corrections to TCs related to E-UTRAN FDD - UTRAN measurements: 8.5.1, 8.5.2 and 8.5.3	9.3.0	9.4.0
2011-03	RAN#51	R5-110930	0328	-	UE Measurement procedures tests: Corrections to Message contents	9.3.0	9.4.0
2011-03	RAN#51	R5-110931	0329	-	DL-RMC-s and OCNG for RRM tests: Updates	9.3.0	9.4.0
2011-03	RAN#51	R5-110946	0331	-	Uncertainties and Test Tolerances for RRM test case 4.3.1.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110948	0332	-	Uncertainties and Test Tolerances for RRM test cases 4.4.1 and 4.4.2	9.3.0	9.4.0
2011-03	RAN#51	R5-110956	0333	-	Modification of test case 5.1.6 - E-UTRAN TDD-TDD inter frequency handover: unknown target cell	9.3.0	9.4.0
2011-03	RAN#51	R5-110957	0334	-	LTE RRM: reference to state 3A in 36.521-3	9.3.0	9.4.0
2011-03	RAN#51	R5-110958	0335	-	Correction to RRM testes for Alignment	9.3.0	9.4.0
2011-03	RAN#51	R5-110959	0336	-	CR to 36.521-3: E-UTRAN FDD - UTRA FDD CPICH RSCP absolute accuracy test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110960	0337	-	CR to 36.521-3: Addition of Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110961	0338	-	CR to 36.521-3: E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting test case	9.3.0	9.4.0
2011-03	RAN#51	R5-110962	0339	-	Correction to exception messages in Radio Link Monitoring Test	9.3.0	9.4.0

2011-03	RAN#51	R5-110963	0340	-	Correction to TC 8.4.2: E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells	9.3.0	9.4.0
2011-03	RAN#51	R5-110964	0341	-	Corrections to TC 8.7.3: E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting under AWGN propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110965	0342	-	Correct the message definitions related to the RSRP and RSRQ performance testing	9.3.0	9.4.0
2011-03	RAN#51	R5-110966	0343	-	Update of RRM test 8.5.2 FDD SON	9.3.0	9.4.0
2011-03	RAN#51	R5-110974	0344	-	PUSCH scheduling: Correction for considering DRX	9.3.0	9.4.0
2011-03	RAN#51	R5-110980	0345	-	Correction to TC 8.8.2: E-UTRAN FDD - GSM Event triggered reporting when DRX is used in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110981	0346	-	Update to TC 8.10.1: E-UTRAN TDD - GSM event triggered reporting in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110982	0347	-	Corrections to TC 8.10.2: E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN	9.3.0	9.4.0
2011-03	RAN#51	R5-110983	0348	-	Modification to TC 8.7.2: E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions	9.3.0	9.4.0
2011-03	RAN#51	R5-110995	0352	-	Radio link monitoring test 7.3.4: Minor correction to the test requirement	9.3.0	9.4.0
2011-03	RAN#51	R5-110996	0353	-	Radio link monitoring tests: Corrections to the test procedure	9.3.0	9.4.0

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