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Part 3: Radio Resource Management (RRM) conformance testing
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Contents

Foreword

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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".

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
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
$S_{ServingCcell}$	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
$Thresh_{x, high}$	Defined in TS 36.304, subclause 5.2.4.7
$Thresh_{x, low}$	Defined in TS 36.304, subclause 5.2.4.7
$Thresh_{serving, low}$	Defined in TS 36.304, subclause 5.2.4.7
$T_{RE-ESTABLISH-REQ}$	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
$Treselection_{RAT}$	Defined in TS 36.304, subclause 5.2.4.7
$Treselection_{EUTRAN}$	Defined in TS 36.304, subclause 5.2.4.7
$Treselection_{UTRAN}$	Defined in TS 36.304, subclause 5.2.4.7
$Treselection_{GERAN}$	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
AWGN	Additive White Gaussian Noise
BCCH	Broadcast Control Channel
BS	Base Station
BSIC	Base transceiver Station Identity Code
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
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
HRPD	High Rate Packet Data
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
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
SFN	System Frame Number
SNR	Signal-to-Noise Ratio
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

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.

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. There are no provisions for the statistical variations that will occur when a parameter is tested. 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 Annex [FFS]. 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.

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

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

- *In the minimum conformance requirements the number of RSRP measurements used are still in brackets, [2] measurements*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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.

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 $T_{SI-EUTRA}$ + 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:

- Intra-frequency carrier

In RRC_IDLE state, the UE shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any allowed combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

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. Message contents 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
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 condition	Active cell		Cell1	
	Neighbour cell		Cell2	
Final condition	Visited cell		Cell2	
E-UTRA RF Channel Number			1	Only one FDD carrier frequency is used.
Channel Bandwidth ($BW_{channel}$)		MHz	10	
Time offset between cells		ms	3	Asynchronous cells
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
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	15	T2 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. 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 2 according to TS 36.508 [7] clause 4.5.2.
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. During time duration T1, Cell 2 shall be powered OFF and the physical cell identity shall be changed to ensure Cell 2 is not detected by the UE.
3. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.1.5-1.
4. The SS waits for random access requests information from the UE to perform cell re-selection to a newly detectable cell, Cell 2.
5. 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.
6. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.2.1.5-1.
7. The SS waits for random access requests information from the UE to perform cell re-selection to an already detected cell, Cell 1.
8. 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.
9. Repeat step 1-8 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	11 + TT	-3.33 + TT	2.36 + TT	-infinity	2.36 + TT	-3.33 + TT
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	11 + TT	8 + TT	11 + TT	-infinity	11 + TT	8 + TT
RSRP Note 3	dBm/15 kHz	-87 + TT	-90 + TT	-87 + TT	-infinity	-87 + TT	-90 + TT
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 = $T_{detect,E-UTRAN\_Intra} + T_{SI-EUTRA}$

$T_{detect,E-UTRAN\_Intra}$ = 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 4.2.2.3

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 = $T_{evaluate,E-UTRAN\_Intra} + T_{SI-EUTRA}$

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

$T_{SI-EUTRA}$ = 1280 ms; 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

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*

4.2.2.1 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 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 $T_{evaluate,E\text{-}UTRAN\_Intra}$ as defined in table 4.2.2.3-1 of TS 36.133 [4] clause 4.2.2.3 when Treselection = 0.

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 $T_{SI\text{-}EUTRA}$ + 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.

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

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	
Final condition	Visited cell		Cell2	
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
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 36.21
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	15	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 4.2.2.4.1-2: Cell Specific Test Parameters for E-UTRAN TDD-TDD intra cell re-selection test case in AWGN

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 TS 36.133 [4] A.3.2.2.1 (OP.2 TDD)		OP.2 TDD		OP.2 TDD	
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	
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	2.36 + TT	-3.33 + TT	-3.33 + TT	2.36 + TT
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-87 + TT	-90 + TT	-90 + TT	-87 + TT
Treselection	s	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.					

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 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 2 according to TS 36.508 [7] clause 4.5.2
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. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.2.5-1.
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 8 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.

4.2.2.4.3 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: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FDD intra frequency cell re-selection test point 1 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**
cellReselectionInfoCommon SEQUENCE {			
q-Hyst	dB0		

Table 4.2.2.4.3-2: *SystemInformationBlockType3*: Additional E-UTRAN FDD-FDD intra frequency cell re-selection test point 2 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**
intraFreqCellReselectionInfo SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)		

Table 4.2.2.4.3-3: *SystemInformationBlockType4*: Additional E-UTRAN FDD-FDD intra frequency cell re-selection test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-3 SystemInformationBlockType4			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqNeighbouringCellList SEQUENCE (SIZE (1..maxCellIntra)) OF SEQUENCE {			
q-OffsetCell	dB0		

Table 4.2.2.4.3-4: *PRACH-ConfigCommonDEFAULT*: Additional E-UTRAN FDD-FDD intra frequency 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	53		

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

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Unit</th><th colspan="2">Cell 1</th><th colspan="2">Cell 2</th></tr>
<tr><th>T1</th><th>T2</th><th>T1</th><th>T2</th></tr>
<tr><td>E-UTRA RF Channel Number</td><td></td><td colspan="2">1</td><td colspan="2">1</td></tr>
<tr><td>$BW_{channel}$</td><td>MHz</td><td colspan="2">10</td><td colspan="2">10</td></tr>
<tr><td>OCNG Pattern defined in TS 36.133 [4] A.3.2.2.1 (OP.2 TDD)</td><td></td><td colspan="2">OP.2 TDD</td><td colspan="2">OP.2 TDD</td></tr>
<tr><td>PBCH_RA</td><td rowspan="13">dB</td><td colspan="2" rowspan="13">0</td><td colspan="2" rowspan="13">0</td></tr>
<tr><td>PBCH_RB</td></tr>
<tr><td>PSS_RA</td></tr>
<tr><td>SSS_RA</td></tr>
<tr><td>PCFICH_RB</td></tr>
<tr><td>PHICH_RA</td></tr>
<tr><td>PHICH_RB</td></tr>
<tr><td>PDCCH_RA</td></tr>
<tr><td>PDCCH_RB</td></tr>
<tr><td>PDSCH_RA</td></tr>
<tr><td>PDSCH_RB</td></tr>
<tr><td>OCNG_RA[Note 1]</td></tr>
<tr><td>OCNG_RB[Note 1]</td></tr>
</table>

Qrxlevmin	dBm	-140		-140	
Pcompensation	dB	0		0	
$Qhyst_s$	dB	0		0	
$Qoffset_{s, n}$	dB	0		0	
Cell_selection_and_ reselection_quality_m easurement		RSRP		RSRP	
$\hat{E}_s/I_{ot}$	dB	2.36 + TT	-3.33 + TT	-3.33 + TT	2.36 + TT
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-87 + TT	-90 + TT	-90 + TT	-87 + TT
Treselection	s	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 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 test requirement in this case is expressed as:

Cell re-selection 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 4.2.2.4

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

The cell re-selection delay 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

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

- *In the minimum conformance requirements the number of RSRP measurements used are still in brackets, [2] measurements*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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 $T_{evaluate,E\text{-}UTRAN\_Inter} + T_{SI\text{-}EUTRA}$ 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 (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ then:

- The UE may not search for, or measure inter-frequency or inter-RAT layers of equal or lower priority
- 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 is not reduced and 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 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 $K_{carrier}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$ 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.

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 $T_{SI\text{-}EUTRA}$ + 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:

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

In RRC_IDLE state, the UE shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any allowed combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

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
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	5	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. At T1 the UE is camped on to Cell 1. 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 2.

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

2. Set the parameters according to duration T1 in Table 4.2.3.5-1. 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 on the lower priority cell, Cell 1.

4. 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.

5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 4.2.3.5-1. During time duration T2, Cell 2 shall be powered OFF and the physical cell identity shall be changed 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 4.2.3.5-1.

7. The SS waits for random access requests information from the UE to perform cell re-selection 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 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 and 4.2.3.5-1 defines the primary level settings including test tolerances for E-UTRAN FDD-FDD inter-frequency cell re-selection test case.

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		
		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	-98					
RSRP Note 3	dBm/15 KHz	-84 + TT	-84 + TT	-84 + TT	-102 + TT	-infinity	-86 + TT
$\hat{E}_s/I_{ot}$	dB	14 + TT	14 + TT	14 + TT	-4 + TT	-infinity	12 + TT
$\hat{E}_s/N_{oc}$	dB	14 + TT	14 + TT	14 + TT	-4 + TT	-infinity	12 + TT
$Treselection_{EUTRAN}$	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

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*

4.2.6.1 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 (or other cells on the same frequency layer) is greater than $S_{nonintrasearch}$ then:

- The UE may not search for, or measure inter-frequency or inter-RAT layers of equal or lower priority
- 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 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 is not reduced and 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 the need for re-selection to 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 $Treselection_{RAT}$ = 0. 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 ($T_{evaluateFDD, Inter}$ + $Treselection_{RAT}$) 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. 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 $K_{carrier}$ * $T_{measure,EUTRAN\_Inter}$ 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 $K_{carrier}$ * $T_{evaluate,E\text{-}UTRAN\_Inter}$ as defined in table 4.2.2.4-1 of TS 36.133 [4] clause 4.2.2.4 when $Treselection_{RAT}$ = 0.

If $Treselection_{RAT}$ 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 $Treselection_{RAT}$ 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 $T_{SI\text{-}EUTRA}$ + 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.

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

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 4.3.1.1.

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 4.2.6.4.1-1.
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	Neighbour cells		Cell1	UE shall perform reselection to cell 1 during T1
	Neighbour cell		Cell2	
T2 end condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA RF Channel Number			1, 2	Two TDD carrier frequencies are used.
Time offset between cells		µs	3	Synchronous cells
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	75	T2 need to be defined so that cell re-selection reaction time is taken into account.

Table 4.2.6.4.1-2: Cell Specific Test Parameters for E-UTRAN TDD-TDD inter frequency cell re-selection 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 Pattern defined in TS 36.133 [4] A.3.2.2.1 (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	-98			
RSRP	dBm/15 KHz	-87 + TT	-87 + TT	-100 + TT	-89 + TT
$\hat{E}_s/I_{ot}$	dB	11 + TT	11 + TT	-2 + TT	9 + TT
$Treselection_{EUTRAN}$	s	0		0	
Snonintrasearch	dB	Not sent		Not sent	
$Thresh_{x, high}$	dB	48		48	
$Thresh_{serving, low}$	dB	44		44	
$Thresh_{x, low}$	dB	50		50	
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.					

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 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 and Cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

1. Ensure the UE is in State 2 according to TS 36.508 [7] clause 4.5.2.
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 1during 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 T2 to T1 as specified in Table 4.2.6.5-1.
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 responds on higher priority cell, Cell 2 during time duration T2 within 68 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.
8. Repeat step 1-7 until the confidence level according to Table G.2.3-1 in Annex G clause G.2 is achieved.

4.2.6.4.3 Message contents

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

Table 4.2.6.4.3-1: *SystemInformationBlockType3*: Additional E-UTRAN TDD-TDD inter frequency cell re-selection test point 1 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**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	44 dB		

Table 4.2.6.4.3-2: *SystemInformationBlockType3*: Additional E-UTRAN TDD-TDD inter frequency cell re-selection test point 2 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**
intraFreqCellReselectionInfo SEQUENCE {			
q-Rxlevmin	-70 (-140 dBm)		

Table 4.2.6.4.3-3: *SystemInformationBlockType5*: Additional E-UTRAN TDD-TDD inter frequency cell re-selection test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-4 SystemInformationBlockType5			
Information Element	**Value/remark**	**Comment**	**Condition**
intraFreqCarrierFreqList SEQUENCE (SIZE (1..maxFreq)) OF SEQUENCE {			
threshX-High	24 (48 dB)		
threshX-Low	25 (50 dB)		

Table 4.2.6.4.3-4: *PRACH-ConfigCommonDEFAULT*: Additional E-UTRAN TDD-TDD inter frequency 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	53		

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	T1	T2
E-UTRA RF Channel number		1		2	
$BW_{channel}$	MHz	10		10	
OCNG Pattern defined in TS 36.133 [4] A.3.2.2.1 (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	-98			
RSRP	dBm/15 KHz	-87 + TT	-87+ TT	-100 + TT	-89 + TT
$\hat{E}_s/I_{ot}$	dB	11 + TT	11 + TT	-2 + TT	9 + TT
$Treselection_{EUTRAN}$	S	0		0	
Snonintrasearch	dB	Not sent		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.					

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

$T_{SI-EUTRA}$ = 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).

The cell re-selection delay 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 2.The cell re-selection delay for lower priority test requirement in this case is expressed as:

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

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

$T_{SI-EUTRA}$ = 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 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

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*

4.3.1.1 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 UE.

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 cell list at the minimum measurement rate. The parameter $N_{UTRA\_carrier}$ is the number of carriers used for all UTRA FDD cells in the neighbour cell 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 (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 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 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 $N_{UTRA\_carrier}$ * $T_{detectUTRA\_FDD}$ (as defined in table 4.2.2.5.1-1 of TS 36.133 [4] clause 4.2.2.5.1) except when UTRA FDD 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 $N_{UTRA\_carrier}$ * $T_{measureUTRA\_FDD}$ except when UTRA FDD 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 o the same frequency layer) is greater 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 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 4.3.1.1.4.1-1: 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		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	
T3 end condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
	Neighbour cell		Cell 1	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 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	25	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		s	5	During T2, 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 T3
T3		s	85	T3 need 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. 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 2 according to TS 36.508 [7] clause 4.5.2.
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. 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 4.3.1.1.5-1 and 4.3.1.1.5-2. During T2, Cell 2 shall be powered off, and during the off time the scrambling code shall be changed
5. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.3.1.1.5-2 and 4.3.1.1.5-2.
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 Cell 2, 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.2.6-1 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

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 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			

Qqualmin	dB	-20		
Qrxlevmin	dBm	-115		
Qrxlevmin	dBm	-140		
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-84+TT	-84+TT	-84+TT
$\hat{E}_s/I_{ot}$	dB	14+TT	14+TT	14+TT
$\hat{E}_s/N_{oc}$	dB	14+TT	14+TT	14+TT
$Treselection_{EUTRAN}$	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	-5+TT	-∞	11+TT
I_{oc}	dBm/3,84 MHz	-70		
CPICH_Ec/Io	dB	-16.19 +TT	-∞	-10.33 +TT
CPICH_RSCP	dBm	-85+TT	-∞	-69+TT
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 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 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 UE.

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 P-CCPCH RSCP of detected UTRA FDD cells in the neighbour cell list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_FDD}$ is the number of carriers used for all UTRA FDD cells in the neighbour cell list. The UE shall filter P-CCPCH 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 (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 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 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) except when UTRA FDD 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 $N_{UTRA\_carrier} * T_{measureUTRA\_FDD}$ except when UTRA FDD 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 o the same frequency layer) is greater 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: [Lowest, 5MHz, and Highest channel bandwidth 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 4.3.1.2.4.1-1.
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 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 4.3.1.2.4.1-1: 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		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			4	As specified in table 5.7.1-2 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.

4.3.1.2.4.2 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 higher 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 2 according to TS 36.508 [7] clause 4.5.2
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 1-5 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.2.3-3 Table H.2.3-4
Default RRC messages and information elements contents exceptions	Table H.3.2-1

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: Cell specific test parameters for Cell 1(E-UTRA FDD)

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		

Qqualmin	dB	-20	
Qrxlevmin	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 4.3.1.2.5-2: 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+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 = $T_{evaluateUTRA\_FDD} + T_{SI-EUTRA}$

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

$T_{SI-EUTRA}$ = 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%.

4.3.2 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*
- *Statistical testing of cell re-selection delay performance requirements are undefined*
- *The message contents of UTRAN TDD are undefined*
- *Whether UTRAN TDD-EUTRAN cell reselection can be done in this test case is 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.

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 UE.

4.3.2.3 Minimum conformance requirements

4.3.2.3.1 3.84Mcps TDD option

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 cell list at the minimum measurement rate specified in this section. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers used for all UTRA TDD cells in the neighbour cell 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 (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 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 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 reselection criteria in TS 36.304 within time ($N_{UTRA\_carrier\_TDD}$) * $T_{detectUTRA\_TDD}$ except when UTRA TDD is of higher priority than the currently selected E-UTRAN 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 $T_{reselection}$ = 0 provided that the reselection criteria is met by a margin of at least [6]dB..

Cells which have been detected shall be measured at least every ($N_{UTRA\_carrier\_TDD}$) * $T_{measureUTRA\_TDD}$ except when UTRA TDD is of higher priority than the currently selected E-UTRAN 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 $T_{measure,UTRA\_TDD}$. 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

4.3.2.4 Test description

4.3.2.4.1 3.84Mcps TDD option

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 FFS.

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
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. At T1 the UE is camped on to Cell 1. 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 TS36.304.

1. Ensure the UE is in State 2 according to TS 36.508 [7] clause 4.5.2.
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 lower priority cell, Cell 1.
4. FFS
5. 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.
6. The SS waits for random access requests information from the UE to perform cell re-selection on the lower priority cell, Cell 2.
7. 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.
8. Repeat step 1-7 until the confidence level according to Tables G.2.6-1 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 4.3.2.4.3-1: *SystemInformationBlockType3*: Additional E-UTRAN FDD to UTRAN TDD cell re-selection 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**
cellReselectionServingFreqInfo SEQUENCE {			
threshServingLow	23 (46 dB)	46 is actual value in dB (23* 2 dB)	
intraFreqCellReselectionInfo SEQUENCE {			
q-Rxlevmin	[-70 (-140 dBm)]	-140 is actual value in dBm (-70 * 2 dBm)	

Table 4.3.2.4.2.3-2: *SystemInformationBlockType6*: Additional E-UTRAN FDD to UTRA TDD cell re-selection test requirement

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-5 SystemInformationBlockType6			
Information Element	**Value/remark**	**Comment**	**Condition**
SystemInformationBlockType6 ::= SEQUENCE {			
utra-FDD-CarrierFreqList SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {}	Not present		
utra-TDD-CarrierFreqList SEQUENCE (SIZE (1..maxUTRA-TDD-Carrier)) OF SEQUENCE {			
utra-CarrierFreq SEQUENCE {			
uarfcn-DL	2		
}			
utra-CellReselectionPriority	3	3 is applicable when UTRA is lower priority than E-UTRA.	
threshX-Low	1 2(24 dB)		
q-RxLevMin	-52 (-103dBm)	The same value as defined in TS 34.108 [5], table 6.1.6a	

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

4.3.2.5 Test requirement

4.3.2.5.1 3.84Mcps TDD option

4.3.2.5.2 1.28Mcps TDD option

Tables 4.3.2.5.2-1, 4.3.2.5-1 and 4.3.2.5-2 defines the primary level settings including test tolerances for E-UTRAN FDD to GSM 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 preambles on the PRACH 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

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

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 UE.

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 cell list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers used for all UTRA TDD cells in the neighbour cell 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 o 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.

4.3.4.1.4 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 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 4.3.4.4.3.
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
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	5	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 neighbor 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 2 according to TS 36.508 [7] clause 4.5.2.
2. Set the parameters according to duration T1 in Table 4.3.4.1.4.1-2 and 4.3.4.1.4.1-3. 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 4.3.4.1.4.1-2 and 4.3.4.1.4.1-3. During T2, cell 2 shall be powered off, and during the off time the scrambling code shall be changed

5. When T2 expires, the SS shall switch the power setting from T2 to T3 as specified in Table 4.3.4.1.4.1-2 and 4.3.4.1.4.1-3.

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.2.6-1 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 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.

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 section 4.2.2.5

$T_{evaluateUTRA\_TDD}$ 19.2s, See 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 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 UE.

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 cell list at the minimum measurement rate. The parameter $N_{UTRA\_carrier\_TDD}$ is the number of carriers used for all UTRA TDD cells in the neighbour cell 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 o 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 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
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 2 according to TS 36.508 [7] clause 4.5.2
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.2.6-1 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_RANote1	dB		
OCNG_RBNote1	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 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 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

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*

4.4.1.1 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 GERAN UE.

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.

If the $S_{ServingCell}$ of the E-UTRA serving cell is greater than $S_{nonintrasearch}$ then:

- The UE may not search for, or measure GSM cells if the priority of GSM is 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 TS36.304 [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 $Thresh_{x, high}$ 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 E-UTRA carrier frequencies and is additionally increased by one if one or more groups of GSM frequencies is configured as a higher priority. 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 [15].

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 RRC_IDLE state, the UE shall be capable of monitoring a total of at least 8 carrier frequency layers, which includes serving layer, comprising of any allowed combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD and GSM layers (one GSM layer corresponds to 32 cells).

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	12 GSM BCCH carriers are 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.
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 2 according to TS 36.508 [7] clause 4.5.2.
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

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	-98	
RSRP	dBm/15 KHz	-89 + TT	-102 + TT
$\hat{E}_s/I_{ot}$	dB	9 + TT	-4 + TT
$Treselection_{EUTRAN}$	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 + TT	-75 + TT
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

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

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*
- *Statistical testing of cell re-selection delay performance requirements are undefined*

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 GERAN UE.

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 TS36.304 [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 4.3.1.1.

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 4.4.2.4.1-1 [clause FFS in reference FFS].
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 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	12 GSM BCCH carriers are used
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 FDD layer.

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

4.4.2.4.3 Message contents

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

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 FDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel number		1	
$BW_{channel}$	MHz	10	
OCNG Patterns defined in D.2		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	-98	
RSRP	dBm/15 KHz	-89+TT	-100+TT
$\hat{E}_s/I_{ot}$	dB	9+TT	-2+TT
$T_{reselectionEUTRAN}$	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 4.4.1.5-2: 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+TT	-75+TT
RXLEV_ACCESS_MIN	dBm	-104	
MS_TXPWR_MAX_CCH	dBm	33	

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

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 DRX cycles are undefined*
- $\hat{I}_{or}/I_{oc}$ *test parameter values are undefined*
- *The evaluation period of cell re-selection criteria for inter-frequency is undefined*
- *The test requirements themselves defined in 36.133 Annex A are undefined*
- *The transmission scheme (1Tx or 2Tx) undefined*
- *The Initial Conditions including UE setup are 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 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.

4.5.1.2 Test applicability

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

4.5.1.3 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 Neighbor 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 Neighbor 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 Neighbor 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 $T_{evaluateHRPD}$.

4.5.1.4 Test description

4.5.1.4.1 Initial conditions

Test Environment: Normal, [FFS: Other combinations of temperature and voltage, as specified in clauses FFS of this document]

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.

1. Connect the SS and interfering source to the UE antenna connectors as shown in Figure [FFS in clause FFS of this document].
2. The general test parameter settings are set up according to [clause FFS in reference FFS].
3. The parameter settings for the cells are set up according to [clause FFS in reference FFS].
4. Downlink signals are initially set up according to [clause FFS in reference FFS].
5. Propagation conditions are set according to [FFS in clause FFS of this document].
6. The parameters for cell re-selection are set up according to [clause FFS in reference FFS].
7. The HRPD cell re-selection parameters are set up according to [clause FFS in reference FFS].
8. Message contents are as defined in clause 4.5.1.4.3

[FFS]

4.5.1.4.2 Test procedure

[FFS]

4.5.1.4.3 Message contents

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

4.5.1.5 Test requirement

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%.

[FFS]

4.6 E-UTRAN to cdma200 1xRTT Cell Re-Selection

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

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 DRX cycles are undefined*
- $\hat{I}_{or}/I_{oc}$ *test parameter values are undefined*
- *The evaluation period of cell re-selection criteria for inter-frequency is undefined*
- *The test requirements themselves defined in 36.133 Annex A are undefined*

- *The transmission scheme (1Tx or 2Tx) undefined*
- *The Initial Conditions including UE setup are 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 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.

4.6.1.2 Test applicability

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

4.6.1.3 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 Neighbor 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 Neighbor 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 Neighbor 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 $T_{evaluateCDMA2000\ 1X}$.

4.6.1.4 Test description

4.6.1.4.1 Initial conditions

Test Environment: Normal, [FFS: Other combinations of temperature and voltage, as specified in clauses FFS of this document]

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.

1. Connect the SS and interfering source to the UE antenna connectors as shown in Figure [FFS in clause FFS of this document].

2. The general test parameter settings are set up according to [clause FFS in reference FFS].

3. The parameter settings for the cells are set up according to [clause FFS in reference FFS].

4. Downlink signals are initially set up according to [clause FFS in reference FFS].

5. Propagation conditions are set according to [FFS in clause FFS of this document].

6. The parameters for cell re-selection are set up according to [clause FFS in reference FFS].

7. The cdma2000 1xRTT cell re-selection parameters are set up according to [clause FFS in reference FFS].

8. Message contents are as defined in clause 4.6.1.4.3

[FFS]

4.6.1.4.2 Test procedure

[FFS]

4.6.1.4.3 Message contents

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

4.6.1.5 Test description

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%.

[FFS]

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.

5.1 E-UTRAN Handover

5.1.1 E-UTRAN FDD-FDD Handover intra frequency case

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*

5.1.1.1 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. Regardless of whether DRX is in use by the UE, T_{search} shall still be bsed 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. Relevant cell identificaiton 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.5.1.2

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
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 3 according to TS 36.508 [7] clause 4.5.3.
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 neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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. When T3 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.

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. Repeat step 1-11 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.3.2-1 Table H.3.2-3

Table 5.1.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD-FDD intra frequency handover test requirement

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	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
Hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 5.1.1.4.3-3: *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 5.1.1.4.3-4: MeasuredResults: Additional E-UTRAN FDD-FDD intra frequency handover 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 5.1.1.4.3-5: *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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
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 + TT	-3.3 + TT	-3.3 + TT	-Infinity	2.36 + TT	2.36 + TT
N_{oc} Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	8 + TT	8 + TT	8 + TT	- Infinity	11 + TT	11 + TT
RSRP Note 3	dBm/15 KHz	-90 + TT	-90 + TT	-90 + TT	- Infinity	-87 + TT	-87 + 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 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

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

- *The RRC procedure delay requirement is not confirmed*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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 receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink UpPTS or 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 UpPTS or PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new UpPTS or 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. Regardless of whether DRX is in use by the UE, T_{search} shall still be bsed on non-DRX target cell search times.

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

NOTE: The actual value of T_{IU} shall depend upon the UpPTS or 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 identificaiton 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
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in Annex A
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
T1		s	5	
T2		s	≤5	
T3		s	1	

Table 5.1.2.4.1-2: Cell Specific Test 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 + TT	-3.3 + TT	-3.3 + TT	-Infinity	2.36 + TT	2.36 + TT
N_{oc}	dBm/15 KHz	-98					
RSRP	dBm/15 KHz	-90 + TT	-90 + TT	-90 + TT	- Infinity	-87 + TT	-87 + TT
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.							

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 3 according to TS 36.508 [7] clause 4.5.3.
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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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. When T3 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.

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. Repeat step 1-11 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: [FFS].

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 + TT	-3.3 + TT	-3.3 + TT	-Infinity	2.36 + TT	2.36 + TT
N_{oc}	dBm/15 KHz	-98					
RSRP	dBm/15 KHz	-90 + TT	-90 + TT	-90 + TT	- Infinity	-87 + TT	-87 + TT
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 maximum RRC procedure delay test requirement in this case is [10ms; as specified in TS 36.331 [5] clause 11.2].

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

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

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 [45 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%.

5.1.3 E-UTRAN FDD-FDD Handover inter frequency case

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*

5.1.3.1 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. Regardless of whether DRX is in use by the UE, T_{search} shall still be based on non-DRX target cell serach 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. Relevant cell identificaiton 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			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
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. 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 3 according to TS 36.508 [7] clause 4.5.3.
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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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. When T3 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.
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. Repeat step 1-11 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.3.2-1 Table H.3.2-3

Table 5.1.3.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD-FDD inter frequency handover test requirement

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	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 5.1.3.4.3-3: *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 5.1.3.4.3-4: *MeasuredResults*: Additional E-UTRAN FDD-FDD inter frequency handover 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 5.1.3.4.3-5: *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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	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 and 5.1.3.5-1 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 + TT	4 + TT	4 + TT	-Infinity	7 + TT	7 + TT
N_{oc} Note 2	dBm/15 kHz	-98					
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT	4 + TT	-Infinity	7 + TT	7 + TT
RSRP Note 3	dBm/15 KHz	-94 + TT	-94 + TT	-94 + TT	-Infinity	-91 + TT	-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 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

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

- *The RRC procedure delay requirement is not confirmed*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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 receive a RRC message implying handover the UE shall be ready to start the transmission of the new uplink UpPTS or 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 UpPTS or PRACH, excluding the RRC procedure delay. This requirement applies when UE is not required to perform any synchronisation procedure before transmitting on the new UpPTS or 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 bsed on non-DRX target cell search times.

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

NOTE: The actual value of T_{IU} shall depend upon the UpPTS or 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 identificaiton 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 carrier 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 case

Parameter		Unit	Value	Comment
m			DL Reference Measurement Channel R.0 TDD	As specified in Annex A
PCFICH/PDCCHPHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in Annex A
Gap Pattern Id			1	As specified in 3GPP TS 36.133 section 8.1.2.1.
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 are used
Channel Bandwidth ($BW_{channel}$)		MHz	10	
A3-Offset		dB	-4	
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
T1		s	5	
T2		s	≤5	
T3		s	1	

Table 5.1.4.4.1-2: Cell Specific Test 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 + TT	4 + TT	4 + TT	-Infinity	7 + TT	7 + TT
N_{oc}	dBm/15 KHz	-98					
RSRP	dBm/15 KHz	-94 + TT	-94 + TT	-94 + TT	- Infinity	-91 + TT	-91 + TT
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.							

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 3 according to TS 36.508 [7] clause 4.5.3.
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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 [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. When T3 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.

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.Repeat step 1-11 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: [FFS].

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 + TT	4 + TT	4 + TT	-Infinity	7 + TT	7 + TT
N_{oc}	dBm/15 KHz	-98					
RSRP	dBm/15 KHz	-94 + TT	-94 + TT	-94 + TT	- Infinity	-91 + TT	-91 + TT
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 maximum RRC procedure delay test requirement in this case is [10ms; 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 [45 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 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*
- *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*

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 UE.

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 with the activation time "now" or earlier than RRC procedure delay seconds from the end of the last E-UTRAN TTI containing the RRC command, 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.

If the access is delayed to an indicated activation time later than E-UTRAN RRC procedure delay seconds from the end of the last TTI containing the E-UTRAN RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time + interruption time.

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, i.e. the time between the last TTI containing a transport block on the E-UTRAN PDSCH and the time the UE starts transmission of the new uplink DPCCH depends on whether the target cell is known for 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 known 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	-101	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 ans send a measurmeent 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 3 according to TS 36.508 [7] clause 4.5.3.
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. 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. When T3 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.

11. Repeat step 1-10 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 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.3.3-1 Table H.3.3-3

Table 5.2.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD – UTRAN FDD 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-B2-UTRA		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 5.2.1.4.3-3: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN FDD – UTRAN FDD 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	39 (-101 dBm)	-101 dBm EUTRA-Thres is actual threshold value in dBm (39 – 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 5.2.1.4.3-4: *MeasuredResults*: Additional E-UTRAN FDD – UTRAN FDD 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 {			
measResultListUTRA	MeasResultListUTRA		
…			
}			
…			
}			

Table 5.2.1.4.3-5: *MeasResultListUTRA*: Additional E-UTRAN FDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physicallCellIdentity CHOICE {			
cellIdentityFDD	UTRA-FDD-CellIdentity		
cellIdentityTDD	Not present		
}			
globalCellIdentity SEQUENCE {			
globalcellID-UTRA	GlobalCellId-UTRA		
lac-Id	Not present		
rac-Id	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
mode CHOICE {			
fdd SEQUENCE {			
cpich-RSCP		Set according to specific test	
cpich-EcN0		Set according to specific test	
…			
}			
}			
}			
}			

Table 5.2.1.4.3-6: *UTRA-FDD-CellIdentity*: Additional E-UTRAN FDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
UTRA-FDD-CellIdentity ::= SEQUENCE {			
primaryScramblingCode	250	This is the typical value range used in UTRAN FDD tests.	
}			

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 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]	dB			
OCNG_RB[Note]	dB			
$\hat{E}_s/I_{ot}$	dB	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: 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	Note 1		
OCNS_Ec/Ior	dB	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
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 + $T_{interrupt}$

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max}$ 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 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%.

5.2.2 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*
- *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*

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 UE.

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 with the activation time "now" or earlier than RRC procedure delay seconds from the end of the last E-UTRAN TTI containing the RRC command, 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.

If the access is delayed to an indicated activation time later than E-UTRAN RRC procedure delay seconds from the end of the last TTI containing the E-UTRAN RRC command, the UE shall be ready to start the transmission of the new uplink DPCCH at the designated activation time + interruption time.

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, i.e. the time between the last TTI containing a transport block on the E-UTRAN PDSCH and the time the UE starts transmission of the new uplink DPCCH depends on whether the target cell is known for 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 known 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	-101	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 measurmeent 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 3 according to TS 36.508 [7] clause 4.5.3.

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. When T3 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.

11. Repeat step 1-10 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: *MobilityFromEUTRACommand*: Additional E-UTRAN TDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.2.2			
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		
}			
}			
}			
}			

Table 5.2.2.4.3-2: *Handover*: Additional E-UTRAN TDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.2.2			
Information Element	**Value/remark**	**Comment**	**Condition**
Handover ::= SEQUENCE {			
targetRAT-Type	Utran	ENUMERATED {utran, geran, cdma2000-1XTT, cdma2000-HRPD, spare4, spare3, spare2, spare1, …}	

Table 5.2.2.4.3-3: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD – UTRAN FDD handover

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 {			
measurementConfiguration	Present		
	MeasurementConfiguration-DEFAULT		MEAS

Table 5.2.2.4.3-4: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN TDD – UTRAN FDD 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-B2-UTRA		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 5.2.2.4.3-5: *ReportConfigInterRAT-B2-UTRA*: Additional E-UTRAN TDD – UTRAN FDD 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	39 (-101dBm)	The actual value is (IE value - 140) dB	
}			
b2-Threshold2 CHOICE {			
b2-Threshold2-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18dB)	The actual value is (IE value – 49)/2 dB	
}			
}			
}			
}			
timeToTrigger	ms0		
}			
}			
maxReportCells	6		
reportInterval	ms1024		
reportAmount	infinity		
}			

Table 5.2.2.4.3-6: *MeasuredResults*: Additional E-UTRAN TDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	1		
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
neighbouringMeasResults CHOICE {			
measResultListUTRA	MeasResultListUTRA		
…			
}			
…			
}			

Table 5.2.2.4.3-7: *MeasResultListUTRA*: Additional E-UTRAN TDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultsListUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physicallCellIdentity CHOICE {			
cellIdentityFDD	UTRA-FDD-CellIdentity		
cellIdentityTDD	Not present		
}			
globalCellIdentity SEQUENCE {			
globalcellID-UTRA	GlobalCellId-UTRA		
lac-Id	Not present		
rac-Id	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
mode CHOICE {			
fdd SEQUENCE {			
cpich-RSCP		Set according to specific test	
cpich-EcN0		Set according to specific test	
…			
}			
}			
}			
}			

Table 5.2.2.4.3-8: *UTRA-FDD-CellIdentity*: Additional E-UTRAN TDD – UTRAN FDD handover

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
UTRA-FDD-CellIdentity ::= SEQUENCE {			
primaryScramblingCode	250	Value range INTEGER (0..511)	
}			

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)		OP.1 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	-98	-98
$\hat{E}_s/I_{oc}$	dB	0	0	0
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	-1.8
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io	dB	-infinity	-14	-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 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 + $T_{interrupt}$

$T_{interrupt1} = T_{IU} + T_{sync} + 50 + 10*F_{max}$ 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

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*

5.2.3.1 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 UE.

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 with the activation time "now" or earlier than RRC procedure delay (see below) from the end of the last TTI containing the RRC 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.

If the access is delayed to an indicated activation time later than RRC procedure delay from the end of the last TTI containing the RRC command, the UE shall be ready to transmit (as specified in 3GPP TS 45.010 [13]) on the channel of the new RAT at the designated activation time + interruption time.

The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay. If the activation time is used, it corresponds to the CFN of the E-UTRAN channel.

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, 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 5.2.3.3-2: 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
$T_{identify,gsm}$		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	

5.2.3.4.2 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 3 according to TS 36.508 [7] clause 4.5.3.

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.

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.

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. When T3 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.

11. Repeat step 1-11 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.3.3-2 Table H.3.3-3

Table 5.2.3.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD – 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	Not present		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 5.2.3.4.3-3: *ReportConfigInterRAT-B1-GERAN*: Additional E-UTRAN FDD – 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 5.2.3.4.3-4: *MeasuredResults*: Additional E-UTRAN FDD – GSM 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	
measResultServing SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListGERAN	MeasResultListGERAN		
…			
}			
…			
}			

Table 5.2.3.4.3-5: *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 {			
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	
…			
}			
}			

5.2.3.5 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 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 5.2.3.5-2: 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 + 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 5.2.3.3.-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:

- *RRC procedure delay requirements are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Statistical testing of Handover delay performance requirements 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*
- *Message contents 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 UE.

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 with the activation time "now" or earlier than RRC procedure delay seconds from the end of the last TTI containing the RRC command, 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.

If the access is delayed to an indicated activation time later than RRC procedure delay seconds from the end of the last TTI containing the RRC command, the UE shall be ready to start the transmission of the new uplink DPCH at the designated activation time + interruption time.

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 $T_{interrupt1}$

$$T_{interrupt1} = T_{offset} + T_{UL} + 30*F_{SFN} + [20] + 10*F_{max} \text{ ms}$$

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.x.x.

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
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 ans send a measurmeent report. T3 is defined as the end of the last TTI containing the RRC message implying handover.

1. Ensure the UE is in State 3 according to TS 36.508 [7] clause 4.5.3.
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.
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 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.
7. If the UE transmits the UL 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 testes is increased by one.
8. When T3 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. Any timing information of Cell 2 is deleted in the UE.
9. Repeat step 1-8 until the confidence level according to Tables G.2.6-1 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: [FFS].

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 Cell 1 E-UTRAN TDD cell

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]	dB			
OCNG_RB[Note]	dB			
$\hat{E}_s/I_{ot}$	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%.

5.3 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:

- *Handover delay period requirements are undefined*
- *The Mobility From EUTRA Command message parameters are undefined*
- *InterRAT-Target and InterRAT-Message field description is FFS*
- *The Initial Conditions including UE setup are not complete*
- *The Test Procedure is not complete. The existing text has been derived from the E-UTRAN FDD – UTRAN FDD Handover test case. The text will need to be revisited after the 36.133 Annex A updates.*
- *The Message contents are undefined*
- *The general and specific test parameters requirements defined in 36.133 Annex A are undefined*
- *The Test Requirements are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Statistical testing of Handover delay performance requirements 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 + $T_{interrupt}$ 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, i.e. the time between the last TTI containing a transport block on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD 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 [xx], 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 $SW_K = \left\lceil \frac{srch\_win\_k}{60} \right\rceil$ 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 $SW_O = \left\lceil \frac{srch\_win\_o}{60} \right\rceil$ 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 [xx], which is specific to HRPD.

The normative reference for this requirement is TS 36.133 [4] clause 5.4.1 and A.x.x.x.

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

[Table FFS]

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 3 according to TS 36.508 [7] clause 4.5.3.
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. 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 [FFS] 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. When T3 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.

11. Repeat step 1-10 until the confidence level according to Tables G.2.6-1 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 [FFS]

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

[Table FFS]

Table 5.3.1.5-2: Cell Specific Test requirement Parameters for Cell 2 HRPD cell

[Table FFS]

[FFS]

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:

- *Handover delay period requirements are undefined*
- *The Mobility From EUTRA Command message parameters are undefined*
- *InterRAT-Target and InterRAT-Message field description is FFS*
- *The Initial Conditions including UE setup are not complete*
- *The Test Procedure is not complete. The existing text has been derived from the E-UTRAN FDD – UTRAN FDD Handover test case. The text will need to be revisited after the 36.133 Annex A updates.*
- *The Message contents are undefined*
- *The general and specific test parameters requirements defined in 36.133 Annex A are undefined*
- *The Test Requirements are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*
- *Statistical testing of Handover delay performance requirements 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 + $T_{interrupt}$ 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, i.e. the time between the last TTI containing a transport block on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1xRTT 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 [xx], 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 $SW_K = \left\lceil \frac{\text{srch\_win\_k}}{60} \right\rceil$ 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 $SW_O = \left\lceil \frac{\text{srch\_win\_o}}{60} \right\rceil$ 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.x.x.x.

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

[Table FFS]

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 3 according to TS 36.508 [7] clause 4.5.3.
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. 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 [FFS] 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. When T3 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.
11. Repeat step 1-10 until the confidence level according to Tables G.2.6-1 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

[Table FFS]

Table 5.3.2.5-2: Cell Specific Test requirement Parameters for Cell 2 cdma2000 1xRTT cell

[Table FFS]

[FFS]

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.

6.1 RRC Re-establishment

6.1.1 RRC Re-establishment to E-UTRAN

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

- *RRC Re-establishment minimum conformance requirements are undefined*
- *The working assumption to test the physical layer delay condition need to be confirmed*
- *The Re-establishment delay requirements are undefined*
- *Cell specific requirements are undefined (e.g. 2 cells, 3 cells, etc)*
- *The Initial Conditions including UE setup are not complete (e.g. connection diagram not specified)*
- *The Message contents are undefined*
- *The specific test parameters requirements defined in 36.133 Annex A are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *Statistical testing of RRC re-establishment delay performance requirements are undefined*

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

[FFS]

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: [Lowest, 5MHz, and Highest channel bandwidth 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 Figure [FFS in clause FFS of this document].
2. The parameter settings for the cells are set up according to [clause FFS in reference FFS].
3. Downlink signals are initially set up according to [clause FFS in reference FFS].
4. Propagation conditions are set according to Annex B clause B.1.1.
5. Ensure the UE is in State 3 according to TS 36.508 [7] clause 4.5.3. Message contents are defined in clause 6.1.1.4.3.

6.1.1.4.2 Test procedure

[FFS]

6.1.1.4.3 Message contents

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

6.1.1.5 Test requirement

[FFS]

6.2 Random Access

6.2.1 E-UTRAN FDD – Contention Based Random Access Test

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

- *The Message contents are undefined*
- *The specific test parameters requirements defined in 36.133 Annex A are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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 preambiles. 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 preambes 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 and transmit a preamble with the calculated PRACH transmission power 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 backoff 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 backoff time expires if no Random Access Response is received within the TTI window [RA_WINDOW_BEGIN-RA_WINDOW_END].

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 backoff 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 transmited in the uplink message.

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff 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.x.x.

6.2.1.4 Test description

6.2.1.4.1 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 [FFS].

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.

6.2.1.4.2 Test procedure

The test consists of a single cell. The UE has a downlink PDSCH allocated centered on the center sub-carrier. The E-UTRAN shall not explicitly signal a Random Access Preamble ID to the UE.

[FFS]

6.2.1.4.3 Message contents

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

[FFS]

6.2.1.5 Test requirement

Tables 6.2.1.5-1 and 6.2.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD – contention based random access test.

Table 6.2.1.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD – Contention Based Random Access test

[FFS]

Table 6.2.1.5-2: RACH-Configuration parameters for E-UTRAN FDD – Contention Based Random Access test

[FFS]

6.2.2 E-UTRAN FDD – Non-Contention Based Random Access Test

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

- *The Message contents are undefined*
- *The specific test parameters requirements defined in 36.133 Annex A are undefined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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 preambiles. 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 preambes 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 and transmit a preamble with the calculated PRACH transmission power 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.x.x.

6.2.2.4 Test description

6.2.2.4.1 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 4.3.1.1.

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 [FFS].
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 centered on the center sub-carrier. The E-UTRAN shall signal a Random Access Preamble ID to the UE.

[FFS]

6.2.2.4.3 Message contents

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

[FFS]

6.2.2.5 Test requirement

Tables 6.2.2.5-1 and 6.2.2.5-2 define the primary level settings including test tolerances for E-UTRAN FDD – non-contention based random access test.

Table 6.2.2.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD – Non-Contention Based Random Access test

[FFS]

Table 6.2.2.5-2: RACH-Configuration parameters for E-UTRAN FDD – Non-Contention Based Random Access test

[FFS]

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.

7.1 UE Transmit Timing

7.1.1 E-UTRAN FDD – UE Transmit Timing Accuracy

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*

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 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 $(N_{\text{TA}} + N_{\text{TA offset}}) \times T_{\text{s}}$ 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 $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_{\text{s}}$.

where:

N_{TA} is $0 \le N_{TA} \le 20512$

N_{TA_Ref} is 0 for PRACH; N_{TA_Ref} 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. $(N_{\text{TA\_Ref}} + N_{\text{TA offset}})$ (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.

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 $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_{\text{s}}$ before the downlink timing.

All adjustments made to the UE uplink timing shall follow these rules:

1) The maximum amount of the timing change in one adjustment shall be T_q.

2) The minimum adjustment rate shall be 7 * × T_S per second.

3) The maximum adjustment rate shall be T_q per 200 ms.

Where the maximum autonomous time adjustment step T_q is specified in as defined in table 7.1.2-2 of TS 36.133 [4] clause 7.1.2.

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 uncertainity must be allowed for since there exists the possiblity of two timing adjustmentd during the evaluateion period.

NOTE 2: The minimum adjustment rate of 7 * T_S per second is only to be evaluted 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 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 FSS.

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 3 according to TS 36.508 [7] clause 4.5.3.

2. Set the parameters according to 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 $N_{TA} \times T_S \pm T_e$ ($T_e = 12 \times T_S$ for $\geq$3 MHz downlink bandwidth) 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 $+64 \times T_S$ (approximately +2 µs) compared to that in step 5).

7. The SS shall check that the time adjustment step T_q ($T_q = 2 \times T_S$ for $\geq$3 MHz downlink bandwidth), the minimum adjustment rate ($7 \times T_S$ per second) and the maximum adjustment rate (T_q per 200 ms) are according to the specified limits until the UE transmit timing offset is within $N_{TA} \times T_S \pm T_e$ ($T_e = 12 \times T_S$ for $\geq$3 MHz downlink bandwidth) 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 $N_{TA} \times T_S \pm T_e$ ($T_e = 12 \times T_S$ for $\geq$3 MHz downlink bandwidth) 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.3.4-1 Table H.3.4-2

Table 7.1.1.4.3-2: *SoundingRsUl-ConfigCommon-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
srsBandwidthConfiguration	bw5	Channel-bandwidth-dependent parameter	
srsSubframeConfiguration		Set according to specific test; sc1 for Test 1 and sc2 for Test 2	FDD
ackNackSrsSimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.1.1.4.3-3: *SoundingRsUl-ConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: 36.331 clause 6.3.2			
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		
frequencyDomainPosition	0		
Duration	TRUE	Indefinite duration	
srs-ConfigurationIndex		Set according to specific test; 0 for Test 1 and 77 for Test 2	
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.1.1.4.3-4: *MAC-MainConfiguraiton-RBC*: Additional UE transmit timing accuracy for E-UTRAN FDD test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfiguration-RBC ::= SEQUENCE {			
dl-SCH-Configuration SEQUENCE {}	Not present		
ul-SCH-Configuration SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
drx-Configuration CHOICE {			DRX_S
enable SEQUENCE {			
onDurationTimer	[psf1]		
drx-InactivityTimer	[psf1]		
drx-RetransmissionTimer	[sf1]		
longDRX-CycleStartOffset CHOICE {		sf80 typical value in simulations	
sf80	0		
}			
shortDRX	Not present		
}			
}			

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 level settings including test tolerances for UE transmit timing accuracy for E-UTRAN FDD test.

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
E-UTRA RF Channel Number		1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10
DRX cycle	ms	OFF	80 Note5
PDCCH/PCFICH/PHICH Reference measurement channel Note1		R.6 FDD	R.6 FDD
OCNG Pattern Note2		OP.2 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB OCNG_RA Note3 OCNG_RB Note3	dB	0	0
N_{oc}	dBm/15 kHz	-98	-98
$\hat{E}_s/I_{ot}$	dB	3 + TT	3 + TT
$\hat{E}_s/N_{oc}$	dB	3 + TT	3 + TT
Io Note4	dBm/9 MHz	-65.5 + TT	-65.5 + TT
Propagation condition	-	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 a settable parameter. Note 5: DRX related parameters are defined in TS 36.133 [4] Table A.7.1.1.1-3.			

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	Comment
	Value		
srsBandwidthConfiguration	bw5	bw5	
srsSubframeConfiguration	sc1	sc3	
ackNackSrsSimultaneousTransmission	FALSE	FALSE	
srsMaxUpPTS	N/A	N/A	Not applicable for FDD
srsBandwidth	0	0	No hopping
srsHoppingBandwidth	hbw0	hbw0	
frequencyDomainPosition	0	0	
duration	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	0	77	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	
cyclicShift	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 Value	Comment
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 reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\text{TA\_Ref}} + N_{\text{TA offset}}) \times T_s$.

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 $\pm T_e$.

The following sequence of events shall be used to verify that the requirements are met. The test sequence shall be carried out in RRC_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms (Test 1 and Test 2 respectively):

1) After a connection is setup with Cell 1, the test system (SS) shall verify that the UE transmit timing offset is within N_{TA} x T_S ± 12 x T_S with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

2) The test system (SS) adjusts the downlink transmit timing for the cell by +64 x T_S (approximately +2μs) compared to that in step 1.

3) The test system (SS) shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in TS 36.133 [4] clause 7.1.2 until the UE transmit timing offset is within N_{TA} x T_S ± 12 x T_S with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

4) The test system (SS) shall verify that the UE transmit timing offset stays within N_{TA} x T_S ± 12 x T_S with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

An illustration of the measurement principle is shown in Figure 7.1.1.5-1.

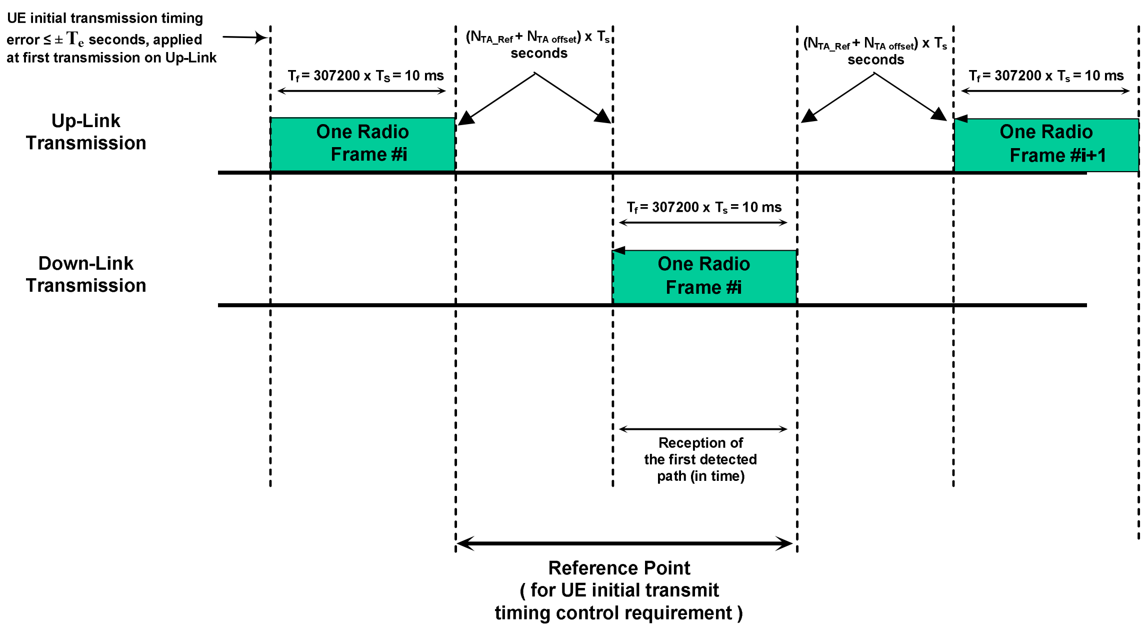

Figure 7.1.1.5-1: Illustration of measurement principle

7.1.2 E-UTRAN TDD – UE Transmit Timing Accuracy

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

- *Message contenets are not complete*
- *Statistic testing of this test case is not defined*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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 $\pm T_e$ seconds 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 $(N_{\mathrm{TA}} + N_{\mathrm{TA\ offset}}) \times T_s$ seconds 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 $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_s$ seconds.

where:

N_{TA} is $0 \le N_{TA} \le 20512$

N_{TA_Ref} is 0 for PRACH; N_{TA_Ref} 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} 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 $T_S = 1/(15000 \times 2048)$ 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 $\pm T_e$ seconds the UE is required to adjust its timing to within $\pm T_e$ seconds**.** The reference timing shall be $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\ offset}}) \times T_s$ seconds before the downlink timing.

All adjustments made to the UE timing $(N_{\mathrm{TA}} + N_{\mathrm{TA\ offset}}) \times T_s$ shall follow these rules:

1) The maximum amount of the timing change in one adjustment shall be T_q seconds.

2) The minimum adjustment rate shall be $7 \times T_S$ seconds per second.

3) The maximum adjustment rate shall be T_q seconds per 200 ms.

Where the maximum autonomous time adjustment step T_q is specified in as defined in table 7.1.2-2 of TS 36.133 [4] clause 7.1.2.

The normative reference for this requirement is TS 36.133 [4] clause 7.1 and A.7.1.2.

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 T_q seconds uncertainity must be allowed for since there exists the possiblity of two timing adjustmentd during the evaluateion period.

NOTE 2: The minimum adjustment rate of $7 \times T_S$ seconds per second is only to be evaluted 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 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 FSS.
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 3 according to TS 36.508 [7] clause 4.5.3.
2. Set the parameters according to Tables 7.1.2.5-1 and 7.1.2.5-2 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 $(N_{TA} +624)\times T_S \pm T_e$ seconds ($T_e = 12 \times T_S$ seconds for ≥3 MHz downlink bandwidth) 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 $+64 \times T_S$ (approximately +2 μs) compared to that in step 5).
7. The SS shall check that the time adjustment step T_q ($T_q = 2 \times T_S$ seconds for ≥3 MHz downlink bandwidth), the minimum adjustment rate ($7 \times T_S$ seconds per second) and the maximum adjustment rate (T_q seconds per 200 ms) are according to the specified limits until the UE transmit timing offset is within $N_{TA} \times T_S \pm T_e$ seconds ($T_e = 12 \times T_S$ seconds for ≥3 MHz downlink bandwidth) 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 $(N_{TA} +624)\times T_S \pm T_e$ seconds ($T_e = 12 \times T_S$ seconds for ≥3 MHz downlink bandwidth) 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: *SoundingRsUl-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
srsBandwidthConfiguration	bw5	Channel-bandwidth-dependent parameter	
srsSubframeConfiguration	src3		
ackNackSrsSimultaneousTransmission	FALSE		
srsMaxUpPts	FALSE		
}			

Table 7.1.2.4.3-2: *SoundingRsUl-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test point 1 requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	ENUMERATED {bw0, bw1, bw2, bw3} bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0	ENUMERATED {hbw0 hbw1 hbw2 hbw3}	
frequencyDomainPosition	0	INTEGER (0..23)	
duration	TRUE	BOOLEAN	
srs-ConfigurationIndex	7	INTEGER (0..1023)	
transmissionComb	0	INTEGER (0..1)	
cyclicShift	cs0	ENUMERATED {cs0 cs1 cs2 cs3 cs4 cs5 cs6 cs7}	
}			
}			

Table 7.1.2.4.3-3: *SoundingRsUl-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test point 2 requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	ENUMERATED {bw0, bw1, bw2, bw3} bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0	ENUMERATED {hbw0 hbw1 hbw2 hbw3}	
frequencyDomainPosition	0	INTEGER (0..23)	
duration	TRUE	BOOLEAN	
srs-ConfigurationIndex	77	INTEGER (0..1023)	
transmissionComb	0	INTEGER (0..1)	
cyclicShift	cs0	ENUMERATED {cs0 cs1 cs2 cs3 cs4 cs5 cs6 cs7}	
}			
}			

Table 7.1.2.4.4-4: MAC-MainConfiguration: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfiguration::= SEQUENCE {			
drx-Configuration CHOICE			
Enable SEQUENCE {			
onDurationTimer	[psf1]	psf1 corresponds to 1 PDCCH subframe	
drx-InactivityTimer	[psf1]	psf1 corresponds to 1 PDCCH subframe	
drx-RetransmissionTimer	[sf1]		
longDRX-CycleStartOffset	[Sf80]	Sf80 corresponds to 8020 subframes	
shortDRX	[disable]	Value not available in 36.331	
}			
}			

Table 7.1.2.4.3-5: *RRCConnectionReconfiguration*: Additional UE transmit timing for E-UTRAN TDD 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 {			
radioResourceConfiguration	RadioResourceConfigDedicated-DRB(n, m)		SRB1-SRB2-DRB(n,m)

Table 7.1.2.4.3-6: *PhysicalConfigDedicated-DEFAULT*: Additional UE transmit timing accuracy for E-UTRAN TDD test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
soundingRsUl-Config			SRB1
	SoundingRsUl-ConfigDedicated-DEFAULT		RBC
antennaInformation CHOICE {			
defaultValue	NULL		
}			
schedulingRequestConfig	Not present		SRB1

7.1.2.5 Test requirement

Tables 7.1.2.5.1-1-1, 7.1.2.5-2 and 7.1.2.5.1-3 define the primary level 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
E-UTRA RF Channel Number		1	1
Channel Bandwidth ($BW_{channel}$)	MHz	10	10
Special subframe configuration[Note1]		6	6
Uplink-downlink configuration[Note2]		1	1
DRX cycle	ms	OFF	80[Note7]
PDCCH/PCFICH/PHICH Reference measurement channel[Note3]		R.6 TDD	R.6 TDD
OCNG Pattern[Note4]		OP.2 TDD	OP.2 TDD
PBCH_RA	dB	0	0
PBCH_RB			
PSS_RA			
SSS_RA			
PCFICH_RB			
PHICH_RA			
PHICH_RB			
PDCCH_RA			
PDCCH_RB			
OCNG_RA[Note5]			
OCNG_RB[Note5]			
N_{oc}	dBm/15 kHz	-98+TT	-98+TT
$\hat{E}_s/I_{ot}$	dB	3+TT	3+TT
$\hat{E}_s/N_{oc}$	dB	3+TT	3+TT
Io[Note6]	dBm/9 MHz	-65.5+TT	-65.5+TT
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: For the reference measurement channels, see section A. Note 4: For the OCNG pattern, see section D. 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 TS 36.133 [4] Table A.7.1.2.5-3.			

Table 7.1.2.5-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Comment
	Value		
srsBandwidthConfiguration	bw5	bw5	
srsSubframeConfiguration	sc3	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	FALSE	
srsMaxUpPTS	FALSE	FALSE	
srsBandwidth	bw0	bw0	No hopping
srsHoppingBandwidth	hbw0	hbw0	
frequencyDomainPosition	0	0	
duration	TRUE	TRUE	Indefinite duration
Srs-ConfigurationIndex	7	77	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.
transmissionComb	0	0	
cyclicShift	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 Value	Comment
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 reference point for the UE initial transmit timing control test requirement shall be the downlink timing minus $(N_{\mathrm{TA\_Ref}} + N_{\mathrm{TA\,offset}}) \times T_{\mathrm{s}}$ seconds.

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.

The following sequence of events shall be used to verify that the requirements are met. The test sequence shall be carried out in RRC_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms (Test 1 and Test 2 respectively):

1) After a connection is setup with Cell 1, the test system (SS) shall verify that the UE transmit timing offset is within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

2) The test system (SS) adjusts the downlink transmit timing for the cell by +64 x T_S (approximately +2μs) compared to that in step 1.

3) The test system (SS) shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in TS 36.133 [4] clause 7.1.2 until the UE transmit timing offset is within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

4) The test system (SS) shall verify that the UE transmit timing offset stays within $(N_{TA} + 624) \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of Cell 1.

An illustration of the measurement principle is shown in Figure 7.1.2.5-4.

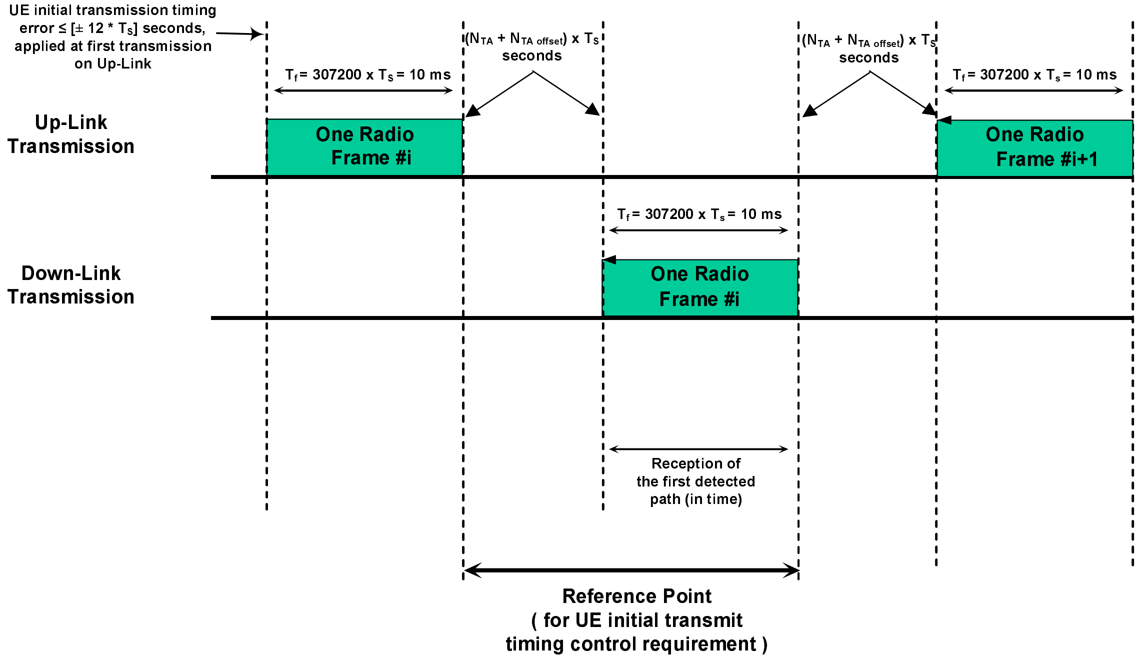

Figure 7.1.2.5-4: Illustration of measurement principle

7.2 UE Timing Advance

7.2.1 E-UTRAN FDD – UE Timing Advance Adjustment Accuracy

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*

7.2.1.1 Test purpose

To verify the UE in RRC_CONNECTED state adjusts the timing of its tramsissions 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 [$\pm 4 \times T_S$] 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.7.2.1.

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.14.

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 (Sounding Reference Symbols) 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 Timing Advance Command value shall be set to 31 during T1 and the Timing Advance Command value shall be set to [39] for T2 . 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 3 according to TS 36.508 [7] clause 4.5.3.

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 a SoundingRsUl-Config message and adjust its uplink timing at sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the Sounding reference signal sub-frame configuration.

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 a SoundingRsUl-Config message and adjust its uplink timing at sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the Sounding reference signal sub-frame configuration.

10. The result from the SoundingRsUl-Config message and adjustment of the timing advance in step 10) is used to measure that the UE adjust the timing of its transmission with a relative accuracy better than or equal to [$\pm 4 \times T_S$] 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 [$\pm 4 \times T_S$] 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.3.4-1 Table H.3.4-2

Table 7.2.1.4.3-2: *MeasuredResults*: Additional E-UTRAN FDD – UE timing advance adjustment 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 7.2.1.4.3-3: *MeasResultListEUTRA*: Additional E-UTRAN FDD – UE timing advance adjustment accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasResultListEUTRA ::= SEQUENCE (SIZE (1..maxCellReport)) OF SEQUENCE {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-UTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult	Not present		
…			
}			
}			

Table 7.2.1.4.3-4: *SoundingRsUl-ConfigCommon-DEFAULT*: Additional E-UTRAN FDD – UE timing advance adjustment accuracy test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
srsBandwidthConfiguration	bw5	Channel-bandwidth-dependent parameter	
srsSubframeConfiguration	sc3		FDD
ackNackSrsSimultaneousTransmission	FALSE		
srsMaxUpPts	Not present		FDD
}			

Table 7.2.1.4.3-5: *SoundingRsUl-ConfigDedicated-DEFAULT*: Additional E-UTRAN FDD – UE timing advance adjustment accuracy test requirement

Derivation Path: 36.331 clause 6.3.2			
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		
frequencyDomainPosition	0		
Duration	TRUE	Indefinite duration	
srs-ConfigurationIndex	7	SRS periodicity of 10	FDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 7.2.1.4.3-6: *MAC-MainConfiguraiton-RBC*: Additional E-UTRAN FDD – UE timing advance adjustment accuracy test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfiguration-RBC ::= SEQUENCE {			
dl-SCH-Configuration SEQUENCE {}	Not present		
ul-SCH-Configuration SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
…			
timeAlignmentTimerDedicated	infinity		

7.2.1.5 Test requirement

Tables 7.1.1.4.1-1, 7.1.1.5-1 and 7.1.1.5-2 define the primary level settings including test tolerances for E-UTRAN FDD – UE timing advance adjustment accuracy test.

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 Timing Advance adjustment accuracy shall meet the requirements in TS 36.133 [4] clause 7.3.2.2.

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	35
$\hat{E}_s/I_{ot}$	dB	3 + TT	
N_{oc}	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3 + TT	
Io Note2	dBm/9 MHz	-65.5 + 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: 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
srsBandwidthConfiguration	bw5	
srsSubframeConfiguration	sc3	Once every 5 subframes
ackNackSrsSimultaneousTransmission	FALSE	
srsMaxUpPTS	N/A	Not applicable for E-UTRAN FDD
srsBandwidth	0	No hopping
srsHoppingBandwidth	hbw0	
frequencyDomainPosition	0	
Duration	TRUE	Indefinite duration
Srs-ConfigurationIndex	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].		

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

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*

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 TDDUE 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 7.3.2 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.14.

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.

1. Ensure the UE is in State 3 according to TS 36.508 [7] clause 4.5.3.
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 a SoundingRsUl-Config message and adjust its uplink timing at sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the Sounding reference signal sub-frame configuration.
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 a SoundingRsUl-Config message and adjust its uplink timing at sub-frame n+6 for a timing advance command T_A received in sub-frame n. Sub-frame n is the Sounding reference signal sub-frame configuration.
10. The result from the SoundingRsUl-Config message and adjustment of the timing advance in step 10) is used to measure that the UE adjust the timing of its transmission with a relative accuracy better than or equal to [$\pm 4 \times T_S$] 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 [$\pm 4 \times T_S$] 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: *RRCConnectionReconfiguration*: Additional U E-UTRAN FDD – UE timing advance adjustment accuracy 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS
radioResourceConfiguration			
	RadioResourceConfigDedicated-SRB1-SRB2-DRB(n, m)		SRB1-SRB2-DRB(n,m)

Table 7.2.2.4.3-2: *SoundingRsUl-ConfigCommon-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigCommon-DEFAULT ::= SEQUENCE {			
srsBandwidthConfiguration	bw5	Channel-bandwidth-dependent parameter	
srsSubframeConfiguration	src3		
ackNackSrsSimultaneousTransmission	FALSE		
srsMaxUpPts	FALSE		
}			

Table 7.2.2.4.3-3: *SoundingRsUl-ConfigDedicated-DEFAULT*: Additional UE transmit timing for E-UTRAN TDD test point 1 requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
SoundingRsUl-ConfigDedicated-DEFAULT ::= CHOICE {			
enable SEQUENCE {			
srsBandwidth	bw0	ENUMERATED {bw0, bw1, bw2, bw3} bw0 used with no frequency hopping. bw3 used with frequency hopping	
srsHoppingBandwidth	hbw0	ENUMERATED {hbw0 hbw1 hbw2 hbw3}	
frequencyDomainPosition	0	INTEGER (0..23)	
duration	TRUE	BOOLEAN	
srs-ConfigurationIndex	7	INTEGER (0..1023)	
transmissionComb	0	INTEGER (0..1)	
cyclicShift	cs0	ENUMERATED {cs0 cs1 cs2 cs3 cs4 cs5 cs6 cs7}	
}			
}			

Table 7.2.1.4.3-4: *MAC-MainConfiguraiton-RBC*: Additional E-UTRAN FDD – UE timing advance adjustment accuracy test requirement

Derivation Path: 36.331 clause 6.3.2			
Information Element	**Value/remark**	**Comment**	**Condition**
MAC-MainConfiguration-RBC ::= SEQUENCE {			
dl-SCH-Configuration SEQUENCE {}	Not present		
ul-SCH-Configuration SEQUENCE {			
maxHARQ-Tx	n5		
periodicBSR-Timer	sf20		
retxBSR-Timer	sf1280		
ttiBundling	FALSE		
}			
…			
timeAlignmentTimerDedicated	infinity		

7.2.2.5 Test requirement

Table 7.2.2.5-2 Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value T1	Value 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	35
$\hat{E}_s/I_{ot}$	dB	3+TT	
N_{oc}	dBm/15 KHz	-98**+**TT	
$\hat{E}_s/N_{oc}$	dB	**3**+TT	
Io[Note4]	dBm/9 MHz	-65.5+TT	
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 7.2.2.5-3: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	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.		

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 [±4* T_S seconds] +TT to the signalled timing advance value compared to the timing of preceding uplink transmission.

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 UE Transmit Timing

7.3.1 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync

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*
- *The test procedure is only in a draft*
- *The Message context is not complete*
- *Some test parameters are still undefined since they are not settled in TS36.133*
- *Initial conditions: Connection diagrams for this test is not specified in TS36.508*

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 TS36.133 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 TS36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS36.213. 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 TS36.331section 5.3.11.

The normative reference for this requirement is TS36.133 [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.

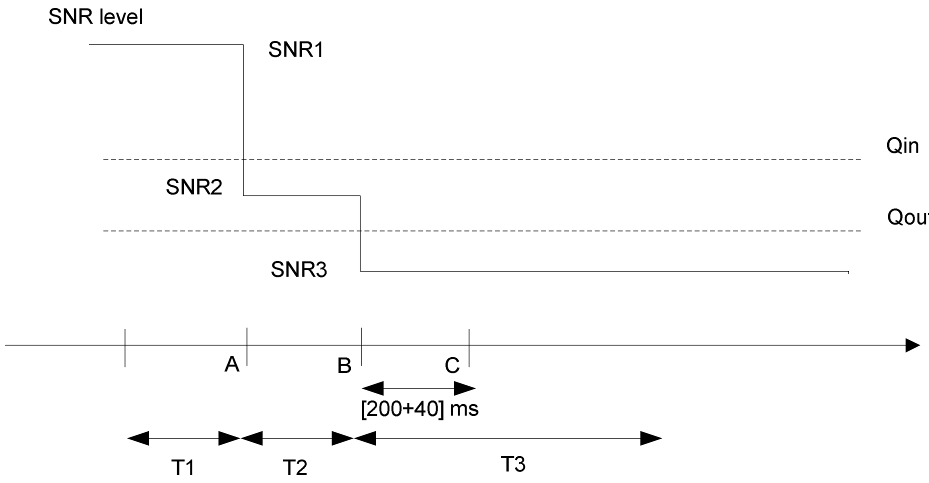

Figure 7.3.1.4-1: SNR variation for out-of-sync testing

(Editor"s note: Behaviours of continuing the transmissions of PUCHH when T310 timer is running could be verified in the tests for in-sync.)

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, for subtests 1 and 2, or connect the SS and [Static [6] tap] sources, for subtests 3 and 4, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure [FFS].

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	
PDSCH parameters			R.0 FDD	R.1 FDD	R.0 FDD	R.1 FDD	As specified in section [A.1.1]
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	R.6 FDD	R.7 FDD	As specified in section [A.2.1]
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	
Transmit antennas			1	2	1	2	
In sync transmission parameters	DCI format		1C	1C	1C	1C	As defined in section 5.3.3.1.4 in TS 36.213
	Number of Control OFDM symbols		2	2	2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 in section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	4	4	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	0	-3	
	Ratio of PCFICH to RS EPRE		4	1	4	1	
Out of sync transmission parameters	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.213
	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 TS36.133 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	[Static [6]-tap]	[Static [6]-tap]	Static [6]-tap channel is defined in 36.101 Annex B, Table TBD.
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]	

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 4 according to TS 36.508 [7] clause 4.5.3 and receiving payload from the SS.
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 FFS 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 and 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 and 7.3.1.5-2 for subtests 3 and 4. T3 starts.
5. If the SS stops receiving CQI reports within [200 + 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. Repeat steps 2-5 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	2	INTEGER (0..767)	
cqi-pmi-ConfigIndex	[0]	INTEGER (0..511)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	[1]	INTEGER (0..1023) Arbitrarily selected as a representative value	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

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		
Transmit antennas		1			2		
OCNG Pattern defined in D.1 (FDD)		OP.1 FDD			OP.1 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						
SNR1	dB	TBD			TBD		
SNR2	dB	TBD			TBD		
SNR3	dB	TBD			TBD		
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.

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		
Transmit antennas		1			2		
OCNG Pattern defined in D.1 (FDD)		OP.1 FDD			OP.1 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						
SNR1	dB	TBD			TBD		
SNR2	dB	TBD			TBD		
SNR3	dB	TBD			TBD		
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		[Static [6]-tap]			[Static [6]-tap]		

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.

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 [200 + 40] 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

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*
- *The test procedure is only in a draft*
- *The Message context is not complete*
- *Some test parameters are still undefined since they are not settled in TS36.133*
- *Initial conditions: Connection diagrams for this test is not specified in TS36.508*

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 TS36.133 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 TS36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS36.213. 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 section 5.3.11 in [2].

The normative reference for this requirement is TS36.133 [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.

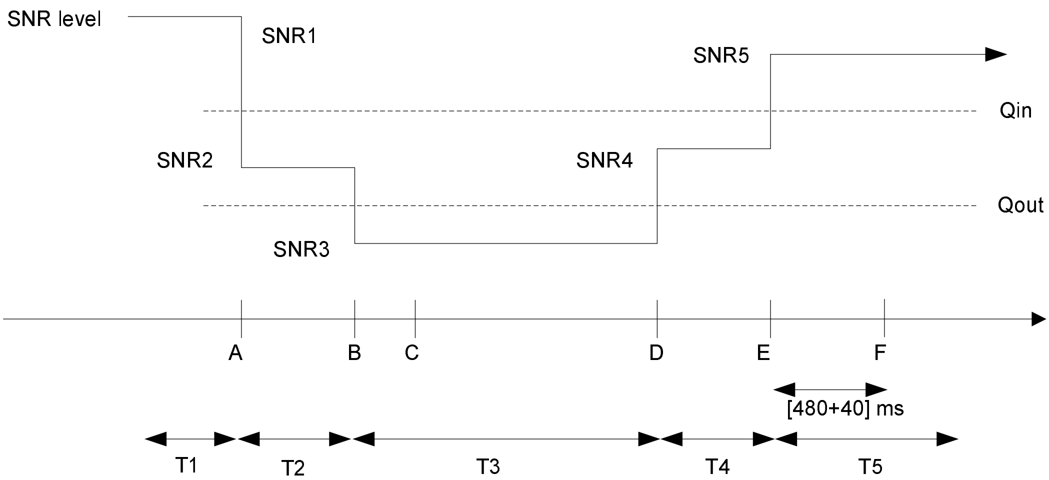

Figure 7.3.2.4-1: SNR variation for in-sync testing

(Editor''s note 1: T310 timer, which starts at Point B (the best scenario), would expire 200 + 40 ms after Point E. '200 + 40 ms' would correspond the safety margin for in-sync detection for in-sync detection at Point E.)

(Editor''s note 2: T310 timer, which starts 200 + 40 ms after Point B (the worst scenario), would expire 480 ms after Point E. Therefore, the verification should be conducted at Point F (480 + [40] ms after Point E).)

(Editor''s note 3: Behaviours of starting T310 timer could be verified in the tests for out-of-sync.)

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 [Static [6] tap] sources, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure [FFS].
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and [Static [6] tap] sources, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure [FFS].

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	
PDSCH parameters			R.0 FDD	R.1 FDD	As specified in section [A.1.1]
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	As specified in section [A.2.1]
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	
Transmit antennas			1	2	
In sync transmission parameters (Not transmitted)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.213
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 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 (Not transmitted)	DCI format		1A	1A	As defined in section 5.3.3.1.4 in TS 36.213
	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 in TS36.133 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			[Static [6]-tap]	[Static [6]-tap]	
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]	

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 4 according to TS 36.508 [7] clause 4.5.3 and receiving payload from the SS.
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 FFS. 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 ([520] ms after the start of time duration T5) in Figure 7.3.2.4-1 the UE fails the test.
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	2	INTEGER (0..767)	
cqi-pmi-ConfigIndex	[0]	INTEGER (0..511)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	[1]	INTEGER (0..1023) Arbitrarily selected as a representative value	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

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				
Transmit antennas		1					2				
OCNG Pattern defined in D.1 (FDD)		OP.1 FDD					OP.1 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										
SNR1	dB	TBD					TBD				
SNR2	dB	TBD					TBD				
SNR3	dB	TBD					TBD				
SNR4	dB	TBD					TBD				
SNR5	dB	TBD					TBD				
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		[Static [6]-tap]					[Static [6]-tap]				

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.

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 ([520] 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

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*
- *The test procedure is only in a draft*
- *The Message context is not complete*
- *Some test parameters are still undefined since they are not settled in TS36.133*
- *Initial conditions: Connection diagrams for this test is not specified in TS36.508*

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 TS36.133 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 TS36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS36.213. 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 TS36.331 section 5.3.11.

The normative reference for this requirement is TS36.133 [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 7.3.4.1-1 shows the three different time durations and the corresponding variation of the downlink SNR in the active cell to emulate out-of-sync states.

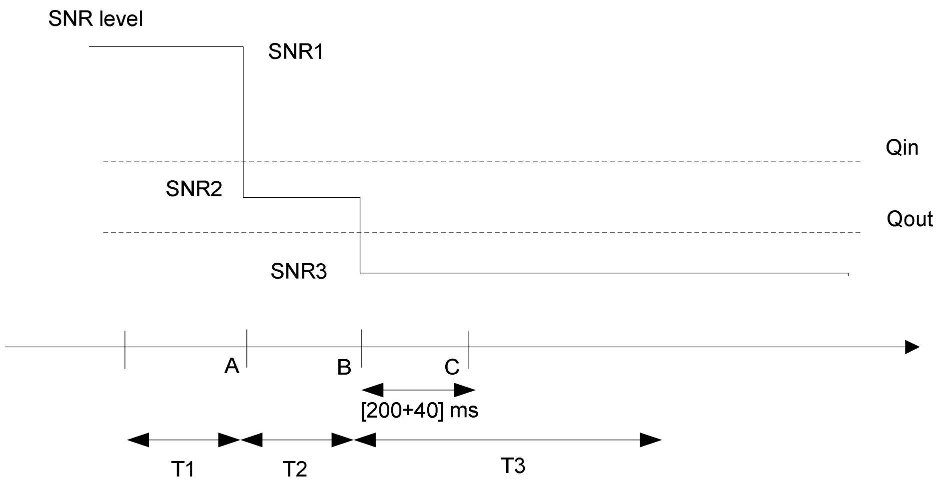

Figure 7.3.3.4-1: SNR variation for out-of-sync testing

(Editor''s note: Behaviours of continuing the transmissions of PUCHH when T310 timer is running could be verified in the tests for in-sync.)

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, for subtests 1 and 2, or connect the SS and Static [6] tap sources, for subtests 3 and 4, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure [FFS].
   [FFS]

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.

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 7.3.3.4.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	
PDSCH parameters			R.0 TDD	R.1 TDD	R.0 TDD	R.1 TDD	As specified in section [A.1.1]
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in section [A.2.1]
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	
Transmit antennas			1	2	1	2	
In sync transmission parameters	DCI format		1C	1C	1C	1C	As defined in section 5.3.3.1.4 in TS 36.213
	Number of Control OFDM symbols		2	2	2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 in section 7.6.1 and Table 7.6.1-2 respectively.
	Aggregation level	CCE	4	4	4	4	
	ρ_A, ρ_B		0	-3	0	-3	
	Ratio of PDCCH to RS EPRE		0	-3	0	-3	
	Ratio of PCFICH to RS EPRE		4	1	4	1	
Out of sync transmission parameters	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.4 in TS 36.213
	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 TS36.133 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	[Static [6]-tap]	[Static [6]-tap]	Static [6]-tap channel is defined in 36.101 Annex B, Table TBD.
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]	

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 2 ms.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.3 and receiving payload from the SS.
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 FFS 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 and 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 and 7.3.3.5-2 for subtests 3 and 4. T3 starts.
5. If the SS stops receiving CQI reports within [200 + 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. Repeat steps 2-5 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: *SystemInformationBlockType2*: Additional E-UTRAN TDD 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 {			
T310	ms0		
T311	ms1000		
N310	n1		
N311	n1		

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	2	INTEGER (0..767)	
cqi-pmi-ConfigIndex	[0]	INTEGER (0..511)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	[1]	INTEGER (0..1023) Arbitrarily selected as a representative value	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

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		
Transmit antennas		1			2		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.1 TDD			OP.1 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						
SNR1	dB	TBD			TBD		
SNR2	dB	TBD			TBD		
SNR3	dB	TBD			TBD		
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.

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		
Transmit antennas		1			2		
Special subframe configuration[Note1]		6			6		
Uplink-downlink configuration[Note2]		1			1		
OCNG Pattern defined in D.2 (TDD)		OP.1 TDD			OP.1 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						
SNR1	dB	TBD			TBD		
SNR2	dB	TBD			TBD		
SNR3	dB	TBD			TBD		
N_{oc}	dBm/15 kHz	-98			-98		
Propagation condition		[Static [6]-tap]			[Static [6]-tap]		

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.

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 [200 + 40] 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

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*
- *The test procedure is only in a draft*
- *The Message context is not complete*

- *Some test parameters are still undefined since they are not settled in TS36.133*
- *Initial conditions: Connection diagrams for this test is not specified in TS36.508*

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 TS36.133 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 TS36.331.

The out-of-sync and in-sync evaluations shall be performed as specified in section 4.2.1 in TS36.213. 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 section 5.3.11 in [2].

The normative reference for this requirement is TS36.133 [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.

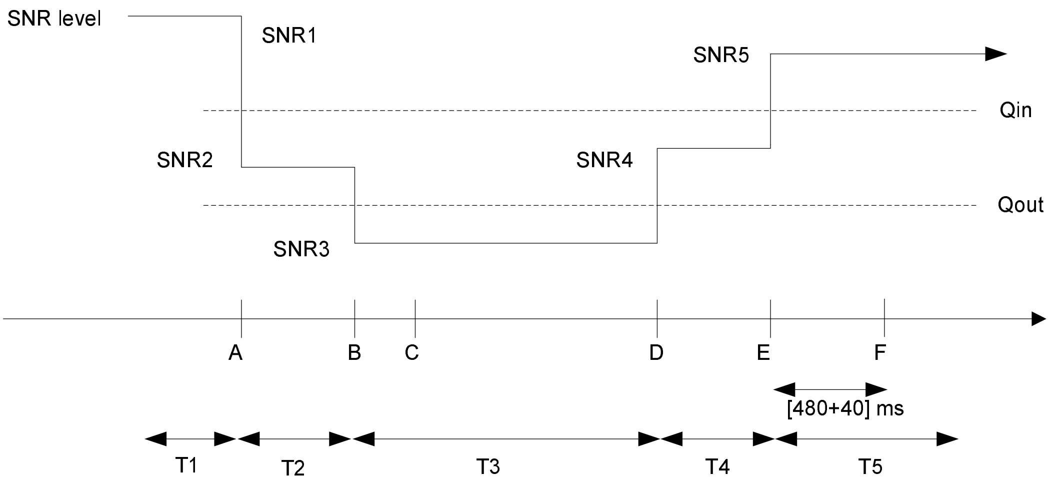

Figure 7.3.4.4-1: SNR variation for in-sync testing

(Editor''s note 1: T310 timer, which starts at Point B (the best scenario), would expire 200 + 40 ms after Point E. '200 + 40 ms' would correspond the safety margin for in-sync detection for in-sync detection at Point E.)

(Editor''s note 2: T310 timer, which starts 200 + 40 ms after Point B (the worst scenario), would expire 480 ms after Point E. Therefore, the verification should be conducted at Point F (480 + [40] ms after Point E).)

(Editor''s note 3: Behaviours of starting T310 timer could be verified in the tests for out-of-sync.)

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 Static [6] tap sources, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure [FFS].
   For subtest 2 (two transmitter antennas): Connect the SS (node B emulator) and Static [6] tap sources, to the UE antenna connectors as shown in TS 36.508 [7] Annex A figure [FFS].

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	
PDSCH parameters			R.0 TDD	R.1 TDD	As specified in section [A.2.1]
PCFICH/PDCCH/PHICH parameters			R.6 TDD	R.7 TDD	As specified in section [A.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	
Transmit antennas			1	2	
In sync transmission parameters (Not transmitted)	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.213
	Number of Control OFDM symbols		2	2	In sync threshold Q_{in} and the corresponding hypothetical PDCCH/PCFICH transmission parameters are as specified in TS36.133 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 (Not transmitted)	DCI format		1A	1A	As defined in section 5.3.3.1.4 in TS 36.213
	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 TS36.133 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			[Static [6]-tap]	[Static [6]-tap]	
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]	

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 2 ms.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.3 and receiving payload from the SS.

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 FFS. 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 ([520] ms after the start of time duration T5) in Figure 7.3.4.4-1 the UE fails the test.

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: *SystemInformationBlockType2*: Additional E-UTRAN TDD 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 {			
T310	[ms2000]		
T311	ms1000		
N310	n1		
N311	n1		

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	2	INTEGER (0..767)	
cqi-pmi-ConfigIndex	[0]	INTEGER (0..511)	
cqi-FormatIndicatorPeriodic CHOICE {			
widebandCQI	NULL		
}			
ri-ConfigIndex	[1]	INTEGER (0..1023) Arbitrarily selected as a representative value	
simultaneousAckNackAndCQI	FALSE	BOOLEAN	
}			
}			
}			

Condition	Explanation
CQI_PERIODIC	When periodic CQI reporting should be enabled

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				
Transmit antennas		1					2				
Special subframe configuration[Note1]		6					6				
Uplink-downlink configuration[Note2]		1					1				
OCNG Pattern defined in D.2 (TDD)		OP.1 TDD					OP.1 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										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PHICH_RA	dB	0					-3				
PHICH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA[Note 3]	dB										
OCNG_RB[Note 3]	dB										
SNR1	dB	TBD					TBD				
SNR2	dB	TBD					TBD				
SNR3	dB	TBD					TBD				
SNR4	dB	TBD					TBD				
SNR5	dB	TBD					TBD				
N_{oc}	dBm/15 kHz	-98					-98				
Propagation condition		[Static [6]-tap]					[Static [6]-tap]				

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.

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 ([520] 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%.

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.

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

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

- *In the minimum requirements the time period have not been decided when a cell has been detectable and enters or leaves the reporting range and the event triggered measurement reporting delay limit has been meant provided the timing to that cell has not changed more than [FFS]*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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:

$T_{basic\_identify\_E-UTRA\_FDD,\ intra}$ 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 $\geq$ -127 dBm for Bands 1, 4, 6, 10, 18, 19 and SCH Ês/Iot $\geq$ - 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, 11, 17 and SCH Ês/Iot ≥ - 6 dB,
- SCH_RP SCH_RP $|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14 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.

$$\mathrm{Y}_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathrm{T}_{\text{Intra}}}{\mathrm{T}_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

Where:

$X_{basic\ measurement\ FDD}$ = 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 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{identify\_intra}$ and then enters or leaves the reporting range, 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 [FFS] while measurement gap has not been available and the L3 filter has not been used

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	-3	
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
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, 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 880 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. Repeat step 1-7 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 8.1.1.4.3-2: *MeasurementConfiguration-DEFAULT*: 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 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModifyList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 8.1.1.4.3-3: *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	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.1.4.3-4: *MeasuredResults*: 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**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServing SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 8.1.1.4.3-5: *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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult	Not present		
…			
}			
}			

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 + TT	-3.79 + TT	-Infinity	1.54 + TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT	-Infinity	7 + TT
RSRP Note 4	dBm/15 KHz	-94 + TT	-94 + TT	-Infinity	-91 + TT
SCH_RP Note 4	dBm/15 KHz	-94 + TT	-94 + TT	-Infinity	-91 + 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.
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 = $T_{identify\_intra}$

$$T_{identify\_intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}}$$

$T_{basic\_identify\_E\text{-}UTRA\_FDD,\ intra}$ = 800 ms

$T_{Measurement\_Period,Intra}$ = 200 ms

T_{Intra} = 200 ms

TTI insertion uncertainty = 80 ms

The overall delays measured shall be less than a total of 880 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 80 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

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

- *In the minimum requirements the time period have not been decided when a cell has been detectable and enters or leaves the reporting range and the event triggered measurement reporting delay limit has been meant provided the timing to that cell has not changed more than [FFS]*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

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

$$T_{identify\ intra} = T_{basic\ identify\ E-UTRA\_FDD,\ intra} \cdot \frac{T_{Measurement\ Period,\ Intra}}{T_{Intra}} \quad ms$$

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 $\geq$ -127 dBm for Bands 1, 4, 6, 10, 18, 19 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, 11, 17 and SCH Ês/Iot > - 6 dB,
- SCH_RP SCH_RP $|_{dBm}\geq$-124 dBm for Bands 3, 8, 12, 13, 14 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.

$$\mathrm{Y}_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement FDD}} \cdot \frac{\mathrm{T}_{\text{Intra}}}{\mathrm{T}_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

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 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{\text{identify\_intra}}$ and then enters or leaves the reporting range, 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 [FFS] while measurement gap has not been available and the L3 filter has not been used.

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	-3	
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	μs	3	Synchronous cells
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. 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

2. Set the parameters according to T1 in Table 8.1.2.5-1. T1 starts.

3. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 8.1.2.5-1.

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 880 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. Repeat step 1-7 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 8.1.2.4.3-2: *MeasurementConfiguration-DEFAULT*: 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 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModifyList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 8.1.2.4.3-3: *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	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.1.2.4.3-4: *MeasuredResults*: 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**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 8.1.2.4.3-5: *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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult			
rsrpResult	Not present		
rsrqResult SEQUENCE {	Not present		
…			
}			
}			

8.1.2.5 Test requirement

Tables 8.1.2.4.1-1 and 8.1.2.5-1 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 + TT	-3.79 + TT	-Infinity	1.54 + TT
N_{oc} Note 3	dBm/15 KHz	-98			
$\hat{E}_s/N_{oc}$	dB	4 + TT	4 + TT	-Infinity	7 + TT
RSRP Note 4	dBm/15 KHz	-94 + TT	-94 + TT	-Infinity	-91 + TT
SCH_RP Note 4	dBm/15 KHz	-94 + TT	-94 + TT	-Infinity	-91 + 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.
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 = 80 ms

The overall delays measured shall be less than a total of 880 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 80 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 with DRX=40ms under fading propagation conditions in synchronous cells

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

- *In the minimum requirements the time period have not been decided when a cell has been detectable and enters or leaves the reporting range and the event triggered measurement reporting delay limit has been meant provided the timing to that cell has not changed more than [FFS]*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.1.3.1 Test purpose

To verify the UE"s ability to make a correct reporting of an event with DRX=40ms 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 $\geq$ -127 dBm for Bands 1, 4, 6, 10 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, 11, 17 and SCH Ês/Iot > - 6 dB,
- SCH_RP SCH_RP $|_{dBm}\geq$-124 dBm for Bands 3, 8, 12, 13, 14 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 $T_{\text{identify intra}}$ 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 has been detectable at least for the time period $T_{\text{identify\_intra}}$ and then enters or leaves the reporting range, 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 [FFS] while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.4.

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 8.1.3.3.3.

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 event triggered reporting under with DRX=40ms fading propagation conditions in synchronous cells

[FFS]

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.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

2. Set the parameters according to T1 in Table 8.1.3.5-1 and 8.1.3.5-2. T1 starts.

3. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 [880 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. Repeat step 1-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

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 with DRX=40ms 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 8.1.3.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=40ms under fading propagation conditions in synchronous cells test requirement

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	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 8.1.3.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=40ms 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 {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	[-6 (-3 dB)]	[-3 is actual value in dB (-6 * 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: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=40ms under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.2			
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	[psf1]		
drx-InactivityTimer	[psf1]		
drx-RetransmissionTimer	[sf1]		
longDRX-CycleStartOffset CHOICE {		sf40 typical value in real network for real-time services.	
[sf40]	0		
}			
shortDRX	[sf40]		
}			
}			

Table 8.1.3.4.3-5: *MeasuredResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=40ms under fading propagation conditions in synchronous cells 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			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 8.1.3.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=40ms 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult			
rsrpResult	Not present		
rsrqResult SEQUENCE {	Not present		
…			
}			
}			

8.1.3.5 Test requirement

Tables 8.1.3.4.1-1, 8.1.3.5-1 and 8.1.3.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting with DRX=40ms under fading propagation conditions in synchronous cells test.

Table 8.1.3.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD event triggered reporting with DRX=40ms under fading propagation conditions in synchronous cells

[FFS]

Table 8.1.3.5-2: DRX Configuration to be used for E-UTRAN FDD-FDD event triggered reporting with DRX=40ms under fading propagation conditions in synchronous cells

[FFS]

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 = $T_{identify\_intra}$

$T_{identify\_intra}$ = [800 ms]. When the DRX cycle length is 40 ms than the $T_{identify\_intra}$ is 0.8 s.

TTI insertion uncertainty = 80 ms

The overall delays measured shall be less than a total of [880 ms] in this test case (note: this gives a total of [800 ms] for measurement reporting delay plus 80 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%.

8.1.4 E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells

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

- *In the minimum requirements the time period have not been decided when a cell has been detectable and enters or leaves the reporting range and the event triggered measurement reporting delay limit has been meant provided the timing to that cell has not changed more than [FFS]*
- *The Test system uncertainties applicable to this test are undefined*
- *The Test tolerances applicable to this test are undefined*

8.1.4.1 Test purpose

To verify the UE"s ability to make a correct reporting of an event with DRX=1280ms under fading propagation conditions in synchronous cells within the E-UTRA FDD-FDD intra frequency cell search requirements.

8.1.4.2 Test applicability

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

8.1.4.3 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 ≥ -127 dBm for Bands 1, 4, 6, 10 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, 11, 17 and SCH Ês/Iot > - 6 dB,
- SCH_RP SCH_RP $|_{dBm}$≥-124 dBm for Bands 3, 8, 12, 13, 14 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 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell has been detectable at least for the time period $T_{identify\_intra}$ and then enters or leaves the reporting range, 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 [FFS] while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 36.133 [4] clause 8.1.2.2.1 and A.8.1.4.

8.1.4.4 Test description

8.1.4.4.1 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 (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 8.1.4.4.1-1.
3. Propagation conditions are set according to Annex B clauses B.0.
4. Message contents are defined in clause 8.1.4.4.3.
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 8.1.4.4.1-1: General Test Parameters for E-UTRAN FDD-FDD event triggered reporting under with DRX=1280ms fading propagation conditions in synchronous cells

[FFS]

8.1.4.4.2 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.

1. Ensure the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
2. Set the parameters according to T1 in Table 8.1.4.5-1 and 8.1.4.5-2. T1 starts.
3. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 8.1.4.5-1 and 8.1.4.5-2.
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 [25.68 s] 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.

8.1.4.4.3 Message contents

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

Table 8.1.4.4.3-1: Common Exception messages for E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms 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 8.1.4.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells test requirement

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	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 8.1.4.4.3-3: *ReportConfigEUTRA-A3*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms 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 {			
eventide CHOICE {			
eventA3 SEQUENCE {			
a3-Offset	[-6 (-3 dB)]	[-3 is actual value in dB (-6 * 0.5 dB)]	
reportOnLeave	FALSE		
}			
}			
Hysteresis	[0 (0 dB)]	[0 is actual value in dB (0 * 0.5 dB)]	
timeToTrigger	[0 (0 ms)]		
}			
}			

Table 8.1.4.4.3-4: *MAC-MainConfig-RBC*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells test requirement

Derivation Path: 36.331 clause 6.3.2			
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	[psf1]		
drx-InactivityTimer	[psf1]		
drx-RetransmissionTimer	[sf1]		
longDRX-CycleStartOffset CHOICE {		sf1280 typical value in real network for best-effort services.	
[sf1280]	0		
}			
shortDRX	Not present		
}			
}			

Table 8.1.4.4.3-5: *MeasuredResults*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells 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			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 8.1.4.4.3-6: *MeasResultListEUTRA*: Additional E-UTRAN FDD-FDD intra frequency event triggered reporting with DRX=1280ms 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult			
rsrpResult	Not present		
rsrqResult SEQUENCE {	Not present		
…			
}			
}			

8.1.4.5 Test requirement

Tables 8.1.4.4.1-1, 8.1.4.5-1 and 8.1.4.5-2 define the primary level settings including test tolerances for E-UTRAN FDD-FDD event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells test.

Table 8.1.4.5-1: Cell Specific Test requirement Parameters for E-UTRAN FDD-FDD event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells

[FFS]

Table 8.1.4.5-2: DRX Configuration to be used for E-UTRAN FDD-FDD event triggered reporting with DRX=1280ms under fading propagation conditions in synchronous cells

[FFS]

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 = $T_{identify\_intra}$ x DRX cycle length

$T_{identify\_intra}$ = [25.6 s]. This is [20 s x 1028 ms].

TTI insertion uncertainty = 80 ms

The overall delays measured shall be less than a total of [25.68 s] in this test case (note: this gives a total of 25.6 s for measurement reporting delay plus 80 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 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

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*

8.2.1.1 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

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 TDD intra frequency cell within

$$T_{\text{identify intra}} = T_{\text{basic identify } E-UTRA\_\text{TDD, intra}} \cdot \frac{T_{\text{Measurement Period, Intra}}}{T_{\text{Intra}}} \quad ms$$

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 $\geq$ -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 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.

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 of all identified cells but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

$$Y_{\text{measurement intra}} = Floor\left\{ X_{\text{basic measurement TDD}} \cdot \frac{T_{\text{Intra}}}{T_{\text{Measurement\_Period, Intra}}} \right\} \text{cells}$$

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.

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 has been detectable at least for the time period $T_{identify\_intra}$ and then enters or leaves the reporting range, 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 [FFS] Ts while transmission gap has not been available and the L3 filter has not been used.

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 4.3.1.1.

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 8.2.1.4.1-1.
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.3.2.2
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	-3	
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			OFF
Time offset between cells	µs	3	Synchronous cells
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.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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 880 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. Repeat step 1-7 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: *RRCConnectionReconfiguration*: 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 4.6.1, 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 8.2.1.4.3-2: *MeasurementConfiguration-DEFAULT*: 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 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModifyList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	ReportConfigEUTRA-A3		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 8.2.1.4.3-3: *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	-6 (-3 dB)	-3 is actual value in dB (-6 * 0.5 dB)	
reportOnLeave	FALSE		
}			
}			
hysteresis	0 (0 dB)	0 is actual value in dB (0 * 0.5 dB)	
timeToTrigger	0 (0 ms)		
}			
}			

Table 8.2.1.4.3-4: *MeasuredResults*: 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**
MeasuredResults ::= SEQUENCE {			
measId	[1]		
measResultServing SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 8.2.1.4.3-5: *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 {			
physicalCellIdentity			
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA			
tac-ID			
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult	Not present		
…			
}			
}			

8.2.1.5 Test requirement

Tables 8.2.1.4.1-1 and 8.2.1.5-1 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.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (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	-94	-Infinity	-91
$\hat{E}_s/I_{ot}$	dB	4	4	-Infinity	7
SCH_RP	dBm/15 kHz	-94	-94	-Infinity	-91
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.					

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 = 80 ms

The overall delays measured shall be less than a total of 880 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 80 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%.

8.3 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

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*

8.3.1.1 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.

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, 18, 19, 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, 11, 17 and RSRP Ês/Iot ≥ -4 dB,
- RSRP$|_{dBm}$≥ -122 dBm for Bands 3, 8, 12, 13, 14 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, 18, 19 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 and SCH_RP/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	$480 \times N_{freq} \times \frac{60}{T_{Inter1}}$	6
1 (Note)	$240 \times N_{freq} \times \frac{60}{T_{Inter1}}$	50
TBD	TBD	TBD
Note: This configuration is optional.		

Where:

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.

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 8.3.1.3-1.

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 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 has been detectable at least for the time period $T_{identify\_inter}$ and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_Inter\_FDD}$ provided the timing to that cell has not changed more than [FFS] while measurement gap has not been available and the L3 filter has not been used.

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 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.
A3-Offset	dB	-3	
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
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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 3840 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 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. Repeat step 1-7 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 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	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		
mbsfn-NeighbourCellConfig	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	-6 (-3 dB)	-3 is actual value in dB (-6 * 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 MeasResultEUTRA {			
physCellId	PhysCellId		
cgi-Info SEQUENCE {			
cellglobalId-EUTRA	cellGlobalId-EUTRA		
trackingAreaCode	trackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult	Not present		
rsrqResult	Not present		
…			
}			
}			

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 + TT	-94 + TT	-Infinity	-91 + TT
$\hat{E}_s/I_{ot}$	dB	4 + TT	4 + TT	-Infinity	7 + TT
SCH_RP	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			

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 TTI insertion uncertainty test requirement in this case is [FFS ms] expressed as:

[2] x TTI_{DCCH} = [FFS ms]

The measurement reporting delay shall be less than a total of 3840 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%.

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

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*

8.4.1.1 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.

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,
- 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.

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 for up to 3 TDD inter-frequencies 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 has been detectable at least for the time period $T_{Identify\_Inter}$ and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement\_Period\_TDD\ Inter}$ provided the timing to that cell has not changed more than [FFS] while measurement gap has not been available and the L3 filter has not been used.

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
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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 7680 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 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. Repeat step 1-7 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: *RRCConnectionReconfiguration*: 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 4.6.1, 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 8.4.1.4.3-2: *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-GP2		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.4.1.4.3-3: *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 8.4.1.4.3-4: *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			
measResultServCell SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 8.4.1.4.3-5: *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		
…			
}			
}			

8.4.1.5 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				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0		0	
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	-Infinity	7 + TT
N_{oc} Note 3	dBm/15 kHz	-98 + TT			
RSRP Note 4	dBm/15 kHz	-94 + TT	-94 + TT	-Infinity	-91 + TT
SCH_RP	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			

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 TTI insertion uncertainty test requirement in this case is [FFS ms] expressed as:

[2] x TTI_{DCCH} = [FFS ms]

The measurement reporting delay shall be less than a total of 7680 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%.

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*
- *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*

8.5.1.1 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.

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

$$T_{identify,\ UTRA\_FDD} = T_{basic\_identify\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq} \quad ms$$

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

$$T_{measurement\_UTRA\_FDD} = Max\left\{T_{Measurement\_Period\ UTRA\_FDD}, T_{basic\_measurement\_UTRA\_FDD} \cdot \frac{480}{T_{inter1}} \cdot N_{Freq}\right\} ms$$

Where:

$X_{basic\ measurement\ UTRA\_FDD}$ = 6 (cells)

$T_{Measurement\_Period\ UTRA\_FDD}$ = 480 ms. The period used for calculating the measurement period.

$T_{basic\_measurement\_UTRA\_FDD}$ = 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 $X_{basic\ measurement\ UTRA\_FDD}$ inter-frequency cells per FDD frequency for up to 3 UTRA FDD carriers and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\_UTRA\_FDD}$.

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 $T_{identify\ UTRA\_FDD}$ 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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 clause B.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 4880 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. Repeat step 1-7 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 8.5.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD – UTRAN FDD event triggered reporting under fading propagation conditions

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModifyList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	ReportConfigInterRAT-B1-UTRA		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

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: 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-Threshold-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18 dB)	-18 dB is actual EcNO value in dB ((13 – 49)/2 dB)	

Table 8.5.1.4.3-4: *MeasuredResults*: 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**
MeasuredResults ::= SEQUENCE {			
measId	1	Identifies the measurement id for the reporting being performed	
measResultServing SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicallCellIdentity CHOICE {			
cellIdentityFDD	UTRA-FDD-CellIdentity		
}			
globalCellIdentity SEQUENCE {			
globalcellID-UTRA	GlobalCellId-UTRA		
lac-Id	Not present		
rac-Id	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
mode CHOICE {			
fdd SEQUENCE {			
cpich-RSCP		Set according to specific test	
cpich-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 Cell 1 E-UTRAN FDD event triggered reporting 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}	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 = 80 ms

The overall delays measured shall be less than a total of 4880 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 80 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%.

8.6 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.

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 ≥ -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 for up to 3 UTRA FDD carriers, 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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.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 8.6.1.5-1 and 8.6.1.5-2.

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 4800 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. Repeat step 1-7 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: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD – UTRAN FDD event triggered reporting 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 {			
measurementConfiguration	Present		
	MeasurementConfiguration-DEFAULT		MEAS

Table 8.6.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN TDD – UTRAN FDD event triggered reporting under fading propagation conditions

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-UTRA		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP2		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

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-Threshold-UTRA CHOICE {			
thresholdUTRA-EcN0	13 (-18dB)	The actual value is (IE value – 49)/2 dB	

Table 8.6.1.4.3-4: *MeasuredResults*: 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**
MeasuredResults ::= SEQUENCE {			
measId	1		
measResultServing SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity CHOICE {			
cellIdentityFDD	UTRA-FDD-CellIdentity		
}			
globalCellIdentity SEQUENCE {			
globalcellID-UTRA	GlobalCellId-UTRA		
lac-Id	Not present		
rac-Id	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
mode CHOICE {			
fdd SEQUENCE {			
cpich-RSCP		Set according to specific test	
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
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 = 80 ms

The overall delays measured shall be less than a total of 4880 ms in this test case (note: this gives a total of 4800 ms for measurement reporting delay plus 80 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*
- *Statistical testing of UE measurement performance requirements 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*
- 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.

8.7.1.3 Minimum conformance requirements

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

$$T_{\text{identify, UTRA\_TDD}} = Max\left\{5000, T_{\text{basic identify UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

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

$$T_{\text{measurement UTRA\_TDD}} = Max\left\{T_{\text{Measurement\_Period UTRA\_TDD}}, T_{\text{basic measurement UTRA\_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

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 $X_{\text{basic measurementUTRA\_TDD}}$ inter-frequency cells per TDD frequency of the monitored set for up to 3 UTRA TDD carrier frequencies, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_TDD}}$.

$X_{\text{basic measurement TDDinter}} = 6$

$T_{Measurement\_Period\ UTRA\_TDD}$ = 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 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.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
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
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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
2. Set the parameters according to T1 in Table"s 8.7.1.5-1 and 8.7.1.5-2. 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"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 [6480 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. Repeat step 1-7 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: RRCConnectionReconfiguration: Additional E-UTRAN TDD – UTRAN TDD event triggered reporting 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 8.7.1.4.3-2: *MeasurementConfiguration-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 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModifyList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModifyList	ReportConfigInterRAT-B1-UTRA		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
neighbourCellConfiguration	Not present		
speedDependentParameters	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-Threshold-UTRA CHOICE {			
thresholdUTRA-RSCP	UTRA-Thres + 115	UTRA-Thres is actual RSCP value in dBm	UTRA-TDD
}			
}			
}			
}			
timeToTrigger	ms0	Value range FFS	
}			
}			
}			

Table 8.7.1.4.3-4: *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	[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)	
}			
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdUTRA		
locationAreaCode	Not present		
routingAreaCode	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
utra-RSRP	[FFS]	Set according to specific test INTEGER (-5..91)	
…			
}			
}			

Table 8.7.1.4.3-6: CellGlobalId-UTRA: Additional E-UTRAN TDD – 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))	
}			

8.7.1.5 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)

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		
$\hat{E}_s/I_{ot}$	dB	9	9
N_{oc}	dBm/15kHz	-98	
RSRP	dBm/15kHz	-89	-89
SCH_RP	dBm/15kHz	-89	-89
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: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.			

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	-3		
DwPCH_Ec/Ior	dB			0	0
OCNS_Ec/Ior NOTE2	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	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 = 80 ms

The overall delays measured shall be less than a total of [6480 ms] in this test case (note: this gives a total of 6400 ms for measurement reporting delay plus 80 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%.

8.8 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*
- *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*

8.8.1.1 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 GERAN UE.

8.8.1.3 Minimum conformance requirements

[Editor"s note: GERAN neighbour cell list requirement should be added]

Measurements on GSM cells can be requested with BSIC verified or BSIC non-verified.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 in [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 [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 480 ms.

The UE shall meet the measurement accuracy requirements stated for RXLEV in TS 45.008, 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 or BSIC non-verified. If GSM measurements are 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.

If no BSIC verification is required then 100% of the measurement gaps available for GSM monitoring shall be used for GSM RSSI purposes.

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 [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 [4].

If the network requests measurements on a GSM cell with BSIC verified, the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 in [4] when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in [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 [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 [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.

This measurement shall be made on GSM cells that are requested with BSIC verified. The 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 [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 [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 [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 [4]).

When no BSIC verification is required, the event triggered measurement reporting delay for a GSM carrier 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 [4]. When L3 filtering is used an additional delay can be expected.

When BSIC verification is required, 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. When L3 filtering is used an additional delay can be expected. For a GSM cell with non-verified BSIC an additional delay according to section 8.1.2.4.5.2.1 of [4] (Initial BSIC identification) 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
2. Set the parameters according to T1 in Table"s 8.8.1.5-1 and 8.8.1.5-2. 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"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 3120ms 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. Repeat step 1-7 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

[FFS]

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
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
Propagation Condition		AWGN	

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 3120ms 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).

The event triggered measurement reporting delay = $2*T_{\text{Measurement Period, GSM}}$ = 2* 480ms =960ms.

Initial BSIC identification delay = 2160 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*
- *Statistical testing of UE measurement performance requirements 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*

8.9.1.1 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 UE..

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 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 Section 9.3 with measurement period given by

$$\mathrm{T}_{\text{measurement UTRA\_TDD}} = Max\left\{\mathrm{T}_{\text{Measurement\_Period UTRA\_TDD}}, \mathrm{T}_{\text{basic measurement UTRA\_TDD}} \cdot \frac{480}{\mathrm{T}_{\text{inter1}}} \cdot N_{Freq}\right\} ms$$

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.

$T_{\text{basic\_identify\_UTRA\_TDD}}$ = 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.

$T_{\text{basic\_measurement\_UTRA\_TDD}}$ = 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 $X_{\text{basic measurementUTRA\_TDD}}$ inter-frequency cells per TDD frequency of the monitored set for up to 3 UTRA TDD carrier frequencies, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{\text{Measurement\_UTRA\_TDD}}$. Where $X_{\text{basic measurement TDDinter}}$ = 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 $T_{\text{identify, UTRA\_TDD}}$ 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 TBD	As specified in TS 36.101 section TBD
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
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. Transmission 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
2. Set the parameters according to T1 in Table"s 8.9.1.5-1 and 8.9.1.5-2. 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"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 12800+TT 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. Repeat step 1-5 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: *RRCConnectionReconfiguration*: Additional E-UTRAN FDD – UTRAN TDD event triggered reporting 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 8.9.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional E-UTRAN FDD – UTRAN TDD event triggered reporting under fading propagation conditions

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-UTRA		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 8.9.1.4.3-3: *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-Threshold-UTRA CHOICE {			
thresholdUTRA-EcN0	44	UTRA-Thres is actual RSCP value in dBm UTRA-Thres + 115	

Table 8.9.1.4.3-4: *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]		
measResultServing SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults CHOICE {			
measResultListUTRA	MeasResultListUTRA		
…			
}			
…			
}			

Table 8.9.1.4.3-5: *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 {			
physicallCellIdentity CHOICE {			
cellIdentityTDD	UTRA-TDD-CellIdentity		
}			
globalCellIdentity SEQUENCE {			
globalcellID-UTRA	GlobalCellId-UTRA		
lac-Id	Not present		
rac-Id	Not present		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
mode {			
tdd SEQUENCE {			
pccpch-RSCP	[FFS]	INTEGER (-5..91)	
…			
}			
}			
}			
}			

Table 8.7.1.4.3-6: CellGlobalId-UTRA: Additional E-UTRAN TDD – 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 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}	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	
Propagation Condition		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 = FFS ms

The overall delays measured shall be less than a total of 12800+TT ms in this test case (note: this gives a total of 12800 ms for measurement reporting delay plus TT 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.

8.10.1.3 Minimum conformance requirements

[Editor"s note: GERAN neighbour cell list requirement should be added]

The requirements in this section apply only to UE supporting E-UTRAN FDD and GSM.

Measurements on GSM cells can be requested with BSIC verified or BSIC non-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 480 ms.

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 or BSIC non-verified. If GSM measurements are 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.

If no BSIC verification is required then 100% of the measurement gaps available for GSM monitoring shall be used for GSM RSSI purposes.

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 with BSIC verified, 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 made on GSM cells that are requested with BSIC verified. The 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 $T_{re\text{-}confirm,GSM}$ 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).

When no BSIC verification is required, the event triggered measurement reporting delay for a GSM carrier 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.

When BSIC verification is required, 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. For a GSM cell with non-verified BSIC an additional delay according to TS 36.133[4] section 8.1.2.4.5.2.1 (Initial BSIC identification) 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.15 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

2.Set the parameters according to T1 in Table"s 8.10.1.5-1 and 8.10.1.5-2. T1 starts.

3. The neighbour cell shall broadcast its own cell identity, and the neighbour cell list of Cell 1 shall contain the cell identity 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 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 960 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. Repeat step 1-7 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: *RRCConnectionReconfiguration*: Additional E-UTRAN TDD – GSM event triggered reporting 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			
	MeasurementConfiguration-DEFAULT		MEAS

Table 8.10.1.4.3-2: *MeasurementConfiguration-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 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasurementConfiguration-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigInterRAT-B1-GERAN		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 8.10.1.4.3-3: *MeasuredResults*: 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 8.10.1.4.3-4: *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 CHOICE {			
networkColourCode		BIT STRING(SIZE(3))	
baseStationColourCode		BIT STRING(SIZE(3))	
}			
cgi_Info SEQUENCE {			
cellGlobalId	CellGlobalIdGERAN		
routingAreaCode	Not present		
}			
measResult SEQUENCE {			
rssi		Set according to specific test	
…			
}			
}			

Table 8.10.1.4.3-5: *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}	
}			

Table 8.10.1.4.3-6: *CellGlobalIdGERAN*: 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**
CellGlobalIdGERAN ::= SEQUENCE {			
plmn-Identity	PLMN-Identity		
localtionAreaCode		BIT STRING (SIZE (16))	
cellIdentity		BIT STRING (SIZE (16))	
}			

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
Propagation Condition		AWGN	

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.

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%.

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.
- 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

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

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

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, 18, 19, 33, 34, 35, 36, 37, 38, 39 and 40

RSRP|dBm≥ -126 dBm for Bands 9

$RSRP|_{dBm} \geq$ -125 dBm for Bands 2, 5, 7, 11, 17

$RSRP|_{dBm} \geq$ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	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.14.
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 in State 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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.
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 SS shall calculate the actual RSRP power of Cell 2 as defined in TS 36.214 [12] clause 5.1.3 which is compared to the reported RSRP value from the same Cell 2 for each MeasurementReport message 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.3.2-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.1.4.3-2: *MeasuredResults*: Additional RSRP FDD Intra frequency absolute 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
…			
}			
}			

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 accuracy test requirements in table 9.1.1.1.5-1 and the reported values test requirements in table 9.1.1.1.5-3.

Table 9.1.1.1.5-1: RSRP FDD Intra frequency absolute accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6 + TT	±9 + TT	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8 + TT	±11 + TT	-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.							

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 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, 18 and 19	dBm/15 kHz	-106	-106	-88	-88	-116	
	Bands 2, 5, 7 and 11						-114	
	Bands 3, 8, 13, …						-113	
	Band 9						-115	
$\hat{E}_s/I_{ot}$		dB	2.5+TT	-6+TT	2.5+TT	-6+TT	0.46+TT	-5.76+TT
RSRP Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-100+TT	-105+TT	-82+TT	-87+TT	-113+TT	-117+TT
	Bands 2, 5, 7 and 11						-111+TT	-115+TT
	Bands 3, 8, 13, …						-110+TT	-114+TT
	Band 9						-112+TT	-116+TT
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-70+TT	-70+TT	-52+TT	-52+TT	-82.43+TT	
	Bands 2, 5, 7 and 11						-80.43+TT	
	Bands 3, 8, 13, …						-79.43+TT	
	Band 9						-81.43+TT	
$\hat{E}_s/N_{oc}$		dB	6+TT	1+TT	6+TT	1+TT	3+TT	-1+TT
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
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS

9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP

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

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

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$|_{dBm}$≥ -127 dBm for Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40

RSRP1,2$|_{dBm}$≥ -126 dBm for Bands 9

RSRP1,2$|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 11, 17

RSRP1,2$|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				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: 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 9.1.2.2, 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 Figure [FFS in clause FFS of this document].
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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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 SS shall calculate the actual RSRP power of Cell 1 and Cell 2 as defined in TS 36.214 [12] clause 5.1.3. The reported RSRP value for Cell 1 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.1.2.5-3.
7. The result from the power level difference of the RSRP values for Cell 1 and Cell 2 reported by the UE in step 6) is compared to the actual power level difference of RSRP for Cell 1 and Cell 2.
8. 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.
9. Repeat step 1-8 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.3.2-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.1.2.4.3-2: *MeasuredResults*: Additional RSRP FDD intra frequency relative 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
…			
}			
}			

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 accuracy test requirements in table 9.1.1.2.5-1 and the reported values test requirements in table 9.1.1.2.5-3.

Table 9.1.1.2.5-1: RSRP FDD Intra frequency relative accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot > -3 dB	dBm	±2 + TT	±3 + TT	-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 + TT	±3 + TT	-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.							

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		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, 18 and 19	dBm/15 kHz	-106	-106	-88	-88	-116	
	Bands 2, 5, 7 and 11						-114	
	Bands 3, 8, 13, …						-113	
	Band 9						-115	
$\hat{E}_s/I_{ot}$		dB	2.5+TT	-6+TT	2.5+TT	-6+TT	0.46+TT	-5.76+TT
RSRP Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-100+TT	-105+TT	-82+TT	-87+TT	-113+TT	-117+TT
	Bands 2, 5, 7 and 11						-111+TT	-115+TT
	Bands 3, 8, 13, …						-110+TT	-114+TT
	Band 9						-112+TT	-116+TT
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-70+TT	-70+TT	-52+TT	-52+TT	-82.43+TT	
	Bands 2, 5, 7 and 11						-80.43+TT	
	Bands 3, 8, 13, …						-79.43+TT	
	Band 9						-81.43+TT	
$\hat{E}_s/N_{oc}$		dB	6+TT	1+TT	6+TT	1+TT	3+TT	-1+TT
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
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_(x - FFS)	RSRP_(x - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)	RSRP_(x + FFS)
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_(x - FFS)	RSRP_(x - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)	RSRP_(x + FFS)
RSRP_x is the reported value of Cell 1			

9.1.2 TDD Intra frequency RSRP Accuracy

9.1.2.1 TDD Intra Frequency Absolute RSRP 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*

9.1.2.1.1 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm≥ -126 dBm for Bands 9,

$RSRP|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 11, 17,

$RSRP|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14.

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6	±9	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8	±11	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ 119dBm/15kHz … -50dBm/ $BW_{Channel}$	-70dBm/ 118dBm/15kHz … -50dBm/ $BW_{Channel}$	-70dBm/ 120dBm/15kHz … -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.14.
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 the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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 cell1.

4. The UE shall transmit RRCConnectionReconfigurationComplete message.

5. UE shall transmit periodically MeasurementReport messages.

6. SS shall check RSRP reported value in MeasurementReport messages. According to Table 9.1.2.1.5-3 the SS shall calculate the actual RSRP measurement value of Cell2 as defined in TS 36.214 [12] clause 5.1.1 which is compared to the reported RSRP value from the same Cell 2 for each MeasurementReport message 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: *RRCConnectionReconfiguration*: Additional RSRP TDD intra frequency absolute accuracy 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 9.1.2.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional RSRP TDD intra frequency absolute accuracy test requirement

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	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 9.1.2.1.4.3-3: *MeasuredResults*: Additional RSRP TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measID			
measResultsServing			
rsrpResult	[FFS]	Value range FFS	
rsrqResult	[FFS]	Value range FFS	
},			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.1.2.1.4.3-4: *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 {			
globalCellIdentity SEQUENCE {			
Plmn-IdentityList	Not present		
}			
measResult			
rsrpResult	According to specific test		
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 accuracy test requirements in table 9.1.2.1.5-1 and the reported values test requirements in table 9.1.2.1.5-3.

Table 9.1.2.1.5-1: RSRP TDD Intra frequency absolute accuracy, test requirements

Parameter	**Unit**	**Accuracy [dB]**		**Conditions[1]**			
		Normal condition	**Extreme condition**	**Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40**	**Bands 2, 5, 7, 11, 17**	**Bands 3, 8, 12, 13, 14**	**Band 9**
				Io	**Io**	**Io**	**Io**
RSRP for Ês/Iot ≥ -6 dB	dBm	±6 + TT	±9 + TT	-121dBm/15kHz … -70dBm/ $BW_{Channel}$	-119dBm/15kHz … -50dBm/ $BW_{Channel}$	-118dBm/15kHz … -50dBm/ $BW_{Channel}$	-120dBm/15kHz … -50dBm/ $BW_{Channel}$
RSRP for Ês/Iot ≥ -6 dB	dBm	±8 + TT	±11 + TT	-70dBm/ $BW_{Channel}$ … -50dBm/ $BW_{Channel}$	-70dBm/ 119dBm/15kHz … -50dBm/ $BW_{Channel}$	-70dBm/ 118dBm/15kHz … -50dBm/ $BW_{Channel}$	-70dBm/ 120dBm/15kHz … -50dBm/ $BW_{Channel}$
Note: Io is assumed to have constant EPRE across the bandwidth.							

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.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	-106	-106	-88	-88	-116	
Ês/Iot		dB	2.5	-6	2.5	-6	0.5	-5.76
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-100	-105	-82	-87	-113	-117
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-70	-70	-52	-52	-81.52	
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_FFS	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS	RSRP_FFS

9.1.2.2 TDD Intra Frequency Relative Accuracy of RSRP

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*

9.1.2.2.1 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP1,2$|_{dBm}$≥ -126 dBm for Bands 9,

RSRP1,2$|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 11, 17,

RSRP1,2$|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14.

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				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: 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.

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 Figure [FFS in clause FFS of this document].
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 the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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 Cell1.
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. According to Table 9.1.2.2.5-3 the SS shall calculate the actual RSRP measurement value of Cell 1 and Cell 2 as defined in TS 36.214 [12] clause 5.1.1. The reported RSRP measurement value for Cell 1 is compared to the reported RSRP measurement value for Cell 2 for each MeasurementReport message according to Table 9.1.2.2.5-3.
7. The result from the power level difference of the RSRP values for Cell 1 and Cell 2 reported by the UE in step 6) is compared to the actual power level difference of RSRP for Cell 1 and Cell 2.
8. 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.
9. Repeat step 1-8 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: *RRCConnectionReconfiguration*: Additional RSRP TDD intra frequency relative accuracy 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 9.1.2.2.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional RSRP TDD intra frequency relative accuracy test requirement

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	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 9.1.2.2.4.3-3: *MeasuredResults*: Additional RSRP TDD intra frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measID			
measResultsServing			
rsrpResult	[FFS]	Value range FFS	
rsrqResult	[FFS]	Value range FFS	
},			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.1.2.2.4.3-4: *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 {			
globalCellIdentity SEQUENCE {			
Plmn-IdentityList	Not present		
}			
measResult			
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 accuracy test requirements in table 9.1.2.2.5-1 and 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: RSRP TDD Intra frequency relative accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot > -3 dB	dBm	±2 + TT	±3 + TT	-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 + TT	±3 + TT	-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.							

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.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	-106	-106	-88	-88	-116	
Ês/Iot		dB	2.5	-6	2.5	-6	0.5	-5.76
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-100	-105	-82	-87	-113	-117
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-70	-70	-52	-52	-81.52	
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 - FFS)	RSRP_(x - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)	RSRP_(x + FFS)
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_(x - FFS)	RSRP_(x - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)	RSRP_(x + FFS)
RSRP_x is the reported value of Cell 1			

9.1.3 FDD Inter frequency RSRP Accuracy

9.1.3.1 FDD - FDD Inter Frequency Absolute RSRP Accuracy

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

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

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40

RSRP|dBm≥ -126 dBm for Bands 9

RSRP|dBm≥ -125 dBm for Bands 2, 5, 7, 11, 17

RSRP|dBm≥ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	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.

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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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 SS shall calculate the actual RSRP power of Cell 2 as defined in TS 36.214 [12] clause 5.1.3 which is compared to the reported RSRP value from the same Cell 2 for each MeasurementReport message 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.3.2-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.3.1.4.3-2: *MeasuredResults*: Additional RSRP FDD Inter frequency absolute 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
…			
}			
}			

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 accuracy test requirements in table 9.1.3.1.5-1 and the reported values test requirements in table 9.1.3.1.5-3.

Table 9.1.3.1.5-1: RSRP FDD Inter frequency absolute accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot ≥ -6 dB	dBm	±6 + TT	±9 + TT	-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 + TT	±11 + TT	-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.							

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
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, 18 and 19	dBm/15 kHz	-88.65	-88.65	-109	-116
	Bands 2, 5, 7 and 11				-107	-114
	Bands 3, 8, 13, …				-106	-113
	Band 9				-108	-115
$\hat{E}_s/I_{ot}$		dB	10+TT	10+TT	14+TT	-5+TT
RSRP Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	78.65+TT	78.65+TT	-95+TT	-121+TT
	Bands 2, 5, 7 and 11				-93+TT	-119+TT
	Bands 3, 8, 13, …				-92	-118+TT
	Band 9				-94	-120+TT
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-49.5+TT	49.5+TT	-67.05+TT	-87.03+TT
	Bands 2, 5, 7 and 11				-65.05+TT	-85.03+TT
	Bands 3, 8, 13, …				-64.05+TT	-84.03+TT
	Band 9				-66.05+TT	-86.03+TT
$\hat{E}_s/N_{oc}$		dB	10+TT	10+TT	14+TT	-5+TT
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
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS

9.1.3.2 FDD - FDD Inter Frequency Relative Accuracy of RSRP

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

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

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, 18, 19, 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, 11, 17,

$RSRP1|_{dBm} \geq -124$ dBm if RSRP1 is on Bands 3, 8, 12, 13, 14

$RSRP2|_{dBm} \geq -127$ dBm if RSRP2 is on Bands 1, 4, 6, 10, 18, 19, 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, 11, 17,

$RSRP2|_{dBm} \geq -125$ dBm if RSRP2 is on Bands 3, 8, 12, 13, 14 .

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	RSRP is on Bands 2, 5, 7, 11, 17	RSRP is on Bands 3, 8, 12, 13, 14	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: 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 9.1.3.2, 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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 SS shall calculate the actual RSRP power of Cell 1 and Cell 2 as defined in TS 36.214 [12] clause 5.1.3. The reported RSRP value for Cell 1 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.3.2.5-3.

7. The result from the power level difference of the RSRP values of Cell 1 and Cell 2 reported by the UE in Step 6) is compared to the actual power level difference of RSRP for Cell 1 and Cell 2.

8. 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.

9. Repeat step 1-8 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.3.2-1 Table H.3.5-1 Table H.3.5-3

Table 9.1.3.2.4.3-2: *MeasuredResults*: Additional RSRP FDD Inter frequency relative 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
…			
}			
}			

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 accuracy test requirements in table 9.1.3.2.5-1 and the reported values test requirements in table 9.1.3.2.5-3.

Table 9.1.3.2.5-1: RSRP FDD Inter frequency relative accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRP is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	RSRP is on Bands 2, 5, 7, 11, 17	RSRP is on Bands 3, 8, 12, 13, 14	RSRP is on Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot > -6dB	dBm	±6 + TT	±6 + TT	-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.							

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 PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RANote1 OCNG_RBNote		dB	0	0	0	0
N_{oc} Note2	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-88.65	-88.65	-109	-116
	Bands 2, 5, 7 and 11				-107	-114
	Bands 3, 8, 13, …				-106	-113
	Band 9				-108	-115
$\hat{E}_s/I_{ot}$		dB	10+TT	10+TT	14+TT	-5+TT
RSRP Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-78.65+TT	-78.65+TT	-95+TT	-121+TT
	Bands 2, 5, 7 and 11				-93+TT	-119+TT
	Bands 3, 8, 13, …				-92	-118+TT
	Band 9				-94	-120+TT
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-49.5+TT	-49.5+TT	-67.05+TT	-87.03+TT
	Bands 2, 5, 7 and 11				-65.05+TT	-85.03+TT
	Bands 3, 8, 13, …				-64.05+TT	-84.03+TT
	Band 9				-66.05+TT	-86.03+TT
$\hat{E}_s/N_{oc}$		dB	10+TT	10+TT	14+TT	-5+TT
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 - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)
RSRP_x is the reported value of Cell 1		

9.1.4 TDD Inter frequency RSRP Accuracy

9.1.4.1 TDD – TDD Inter Frequency Absolute RSRP 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*

9.1.4.1.1 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm≥ -126 dBm for Bands 9,

RSRP|dBm≥ -125 dBm for Bands 2, 5, 7, 11, 17,

RSRP|dBm≥ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	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 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 the UE is in State 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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. According to Table 9.1.4.1.5-3 the SS shall calculate the actual RSRP power of Cell 2 as defined in TS 36.214 [12] clause 5.1.1 which is compared to the reported RSRP value from the same Cell 2 for each MeasurementReport message 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: *RRCConnectionReconfiguration*: Additional RSRP TDD - TDD Inter frequency absolute accuracy 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			
	MeasurementConfiguration-DEFAULT		MEAS

Table 9.1.4.1.4.3-2: *MeasConfig-DEFAULT*: Additional RSRP TDD - TDD Inter frequency absolute accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.1.4.1.4.3-3: *MeasuredResults*: 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			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.1.4.1.4.3-4: *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)	
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalCellIdEUTRA		
trackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
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 accuracy test requirements in table 9.1.4.1.5-1 and the reported values test requirements in table 9.1.4.1.5-3.

Table 9.1.4.1.5-1: RSRP TDD-TDD Inter frequency absolute accuracy, test requirements

Parameter	**Unit**	**Accuracy [dB]**		**Conditions[1]**			
		Normal condition	**Extreme condition**	**Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40**	**Bands 2, 5, 7, 11, 17**	**Bands 3, 8, 12, 13, 14**	**Band 9**
				Io	**Io**	**Io**	**Io**
RSRP for Ês/Iot ≥ -6 dB	dBm	±6 + TT	±9 + TT	-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 + TT	±11 + TT	-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.							

Table 9.1.4.1.5-2: RSRP TDD-TDD Inter frequency absolute 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">Measurement gap configuration</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 in A.3.1.1.2</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.3.1.2.2</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 A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (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>-88.65</td><td>-88.65</td><td>-109</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>-78.65</td><td>-78.65</td><td>-95</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>-49.5</td><td>-49.5</td><td>-67.05</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 9.1.4.1.5-3: RSRP TDD-TDD Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
Normal Conditions		
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_FFS	RSRP_FFS
Highest reported value (Cell 2)	RSRP_FFS	RSRP_FFS

9.1.4.2 TDD - TDD Inter Frequency Relative Accuracy of RSRP

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*

9.1.4.2.1 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 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, 11, 17,

$RSRP1|_{dBm} \geq$ -124 dBm if RSRP1 is on Bands 3, 8, 12, 13, 14,

$RSRP2|_{dBm} \geq$ -127 dBm if RSRP2 is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 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, 11, 17,

$RSRP2|_{dBm} \geq$ -125 dBm if RSRP2 is on Bands 3, 8, 12, 13, 14

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq 27dB$$

| 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, 18, 19, 33, 34, 35, 36, 37, 38, 39 and 40	RSRP is on Bands 2, 5, 7, 11, 17	RSRP is on Bands 3, 8, 12, 13, 14	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: 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 9.1.3.2, 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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 SS shall calculate the actual RSRP measurement value of Cell 1 and Cell 2 as defined in TS 36.214 [12] clause 5.1.1. The reported RSRP value for Cell 1 is compared to the reported RSRP value for Cell 2 for each MeasurementReport message according to Table 9.1.4.2.5-3.
7. The result from the power level difference of the calculated RSRP measurement values of cell Cell 1 and cell Cell 2 reported by the UE in Step 6) is compared to the actual power level difference of RSRP reported values for cell Cell 1 and cell Cell 2.
8. 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.

9. Repeat step 1-8 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: *RRCConnectionReconfiguration*: Additional RSRP TDD - TDD Inter frequency relative accuracy 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

Table 9.1.4.2.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional RSRP TDD - TDD Inter frequency relative accuracy test requirement

Derivation Path: TS 36.508 [7] clause 4.6.6, Table 4.6.6-1 MeasurementConfiguration-DEFAULT			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasConfig-DEFAULT ::= SEQUENCE {			
measObjectToRemoveList	Not present		
measObjectToAddModList	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
preRegistrationInfoHRPD	Not present		
speedStatePars	Not present		
}			

Table 9.1.4.2.4.3-3: *MeasuredResults*: Additional RSRP TDD - TDD Inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	[1]		
measResultServCell			
rsrpResult		According to specific test	
rsrqResult		According to specific test	
},			
measResultNeighCells CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.1.7.2.4.3-4: *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)	
cgi-Info SEQUENCE {			
cellGlobalId	CellGlobalIdEUTRA		
trackingAreaCode	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
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 accuracy test requirements in table 9.1.4.2.5-1 and 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: RSRP TDD-TDD Inter frequency relative accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRP is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39 and 40	RSRP is on Bands 2, 5, 7, 11, 17	RSRP is on Bands 3, 8, 12, 13, 14	RSRP is on Band 9
				Io	Io	Io	Io
RSRP for Ês/Iot > -6dB	dBm	±6 + TT	±6 + TT	-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.							

Table 9.1.4.2.5-2: RSRP TDD-TDD 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
Special subframe configuration[Note1]			6		6	
Uplink-downlink configuration[Note1]			1		1	
Measurement gap configuration			0	-	0	-
Measurement bandwidth		n_{PRB}	22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.2			R.0 TDD	-	R.0 TDD	-
PDSCH allocation		n_{PRB}	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			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
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_RA[Note2]						
OCNG_RB[Note2]						
N_{oc} [Note3]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-88.65	-88.65	-109	-116
$\hat{E}_s/I_{ot}$		dB	10	10	14	-5
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40.	dBm/15 kHz	-78.65	-78.65	-95	-121
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-49.5	-49.5	-67.05	-87.03
$\hat{E}_s/N_{oc}$		dB	10	10	14	-5
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 9.1.4.2.5-3: 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 - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)
Extreme Conditions		
Lowest reported value (Cell 2)	RSRP_(x - FFS)	RSRP_(x - FFS)
Highest reported value (Cell 2)	RSRP_(x + FFS)	RSRP_(x + FFS)
RSRP_x is the reported value of Cell 1		

9.2 RSRQ

9.2.1 FDD Intra frequency RSRQ Accuracy

9.2.1.1 FDD Intra Frequency Absolute RSRQ 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*
- *The RSRQ FDD – FDD inter frequency absolute accuracy test requirements for the reported values are undefined*

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40

RSRP|dBm≥ -126 dBm for Bands 9

$\text{RSRP}|_{\text{dBm}} \geq$ -125 dBm for Bands 2, 5, 7, 11, 17

$\text{RSRP}|_{\text{dBm}} \geq$ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				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.14.

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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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 SS shall calculate the actual RSRQ power of Cell 2 as defined in TS 36.214 [12] clause 5.1.3 which is compared to the reported RSRQ value from the same Cell 2 for each MeasurementReport message 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.3.2-1 Table H.3.5-1 Table H.3.5-4

Table 9.2.1.1.4.3-2: *MeasuredResults*: Additional RSRQ FDD intra frequency absolute 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
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 accuracy test requirements in Table 9.2.1.1.5-1.

The RSRQ FDD intra frequency absolute accuracy test for the reported values shall meet the requirements in Table 9.2.1.1.5-3.

Table 9.2.1.1.5-1: RSRQ FDD intra frequency absolute accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5 + TT	± 4 + TT	-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 + TT	± 4 + TT	-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.							

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, 18 and 19	dBm/15 kHz	-84.76 + TT	-84.76 + TT	-103.85 + TT	-103.85 + TT	-116 + TT	
	Bands 2, 5, 7 and 11						-114 + TT	
	Bands 3, 8, 13, …						-113 + TT	
	Band 9						-115 + TT	
$\hat{E}_s/I_{ot}$		dB	-1.76 + TT	-1.76 + TT	-4.7 + TT	-4.7 + TT	-5.4 + TT	-5.4 + TT
RSRP[Note3]	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-81.76 + TT	-81.76 + TT	-106.75 + TT	-106.75 + TT	-120 + TT	-120 + TT
	Bands 2, 5, 7 and 11						-118 + TT	-118 + TT
	Bands 3, 8, 13, …						-117 + TT	-117 + TT
	Band 9						-119 + TT	-119 + TT
RSRQ[Note3]	Bands 1, 4, 6, 10, 18 and 19	dB	-14.77 + TT	-14.77 + TT	-16.76 + TT	-16.76 + TT	-17.33 + TT	-17.33 + TT
	Bands 2, 5, 7 and 11							
	Bands 3, 8, 13, …							
	Band 9							
Io[Note3]	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-50 + TT	-50 + TT	-73 + TT	-73 + TT	-85.67 + TT	
	Bands 2, 5, 7 and 11						-83.67 + TT	
	Bands 3, 8, 13, …						-82.67 + TT	
	Band 9						-84.67 + TT	
$\hat{E}_s/N_{oc}$		dB	3 + TT	3 + TT	-2.9 + TT	-2.9 + TT	-4 + TT	-4 + TT
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
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS

9.2.2 TDD Intra frequency RSRQ Accuracy

9.2.2.1 TDD Intra Frequency Absolute RSRQ 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*

9.2.2.1.1 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.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40

RSRP|dBm≥ -126 dBm for Bands 9

$RSRP|_{dBm}\geq$ -125 dBm for Bands 2, 5, 7, 11, 17

$RSRP|_{dBm}\geq$ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				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.

Table 9.2.2.1.3-2: 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 9.2.2.1 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.14.

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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.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 SS shall calculate the actual RSRQ power value of cell 2 as defined in TS 36.214 [12] clause 5.1.3 which is compared to the reported RSRQ value from the same Cell2 for each MeasurementReport message 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: *RRCConnectionReconfiguration*: Additional RSRQ TDD intra frequency absolute accuracy 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 9.2.2.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

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	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	Not present		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 9.2.2.1.4.3-3: *ReportConfigEUTRA-PERIODICAL*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose CHOICE {			
reportStrongestCells	NULL		
}			
}			
}			
triggerQuantity	rsrq		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	infinity		
}			

Table 9.2.2.1.4.3-4: *MeasuredResults*: Additional RSRQ TDD intra frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	[1]		
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.2.2.1.4.3-5: *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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
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 accuracy test requirements in Table 9.2.2.1.5-1.

The RSRQ TDD intra frequency absolute accuracy test for the reported values shall meet the requirements in Table 9.2.2.1.5-3.

Table 9.2.2.1.5-1: RSRQ TDD intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Band 9
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5 + TT	± 4 + TT	-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 + TT	± 4 + TT	-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.							

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 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	-84.76 + TT	-84.76 + TT	-103.85 + TT	-103.85 + TT	-116 + TT	
Ês/Iot		dB	3 + TT	3 + TT	-4.7 + TT	-4.7 + TT	-5.4 + TT	-5.4 + TT
RSRP[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.76 + TT	-81.76 + TT	-106.75 + TT	-106.75 + TT	-120 + TT	-120 + TT
RSRQ[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.77 + TT	-14.77 + TT	-16.76 + TT	-16.76 + TT	-17.33 + TT	-17.33 + TT
Io[Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50 + TT	-50 + TT	-73 + TT	-73 + TT	-85.67 + TT	
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
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS

9.2.3 FDD – FDD Inter frequency RSRQ Accuracy

9.2.3.1 FDD – FDD Inter Frequency Absolute RSRQ 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*
- *The RSRQ FDD – FDD inter frequency absolute accuracy test requirements for the reported values are undefined*

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm≥ -126 dBm for Bands 9,

$RSRP|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 11, 17

$RSRP|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14

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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Bands 9
				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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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 SS shall calculate the actual RSRQ power value of Cell 2 as defined in TS 36.214 [12] clause 5.1.3 which is compared to the reported RSRQ value from the same Cell 2 for each MeasurementReport message 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.3.2-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.1.4.3-2: *MeasuredResults*: Additional RSRQ FDD – FDD inter frequency absolute 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		Set according to specific test	
rsrqResult		Set according to specific test	
}			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
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 accuracy test requirements in Table 9.2.3.1.5-1.

The RSRQ FDD – FDD inter frequency absolute accuracy test for the reported values shall meet the requirements in Table 9.2.3.2.5-3.

Table 9.2.3.1.5-1: RSRQ FDD – FDD inter frequency absolute accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Bands 9
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5 + TT	± 4 + TT	-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 + TT	± 4 + TT	-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.							

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		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, 18 and 19	dBm/15 kHz	-80 + TT	-80 + TT	-104 + TT	-104 + TT	-119 + TT	-119 + TT
	Bands 2, 5, 7 and 11						-117 + TT	-117 + TT
	Bands 3, 8, 13, …						-116 + TT	-116 + TT
	Band 9						-118 + TT	-118 + TT
$\hat{E}_s/I_{ot}$		dB	-1.75 + TT	-1.75 + TT	-4.7 + TT	-4.7 + TT	-4.5 + TT	-4.5 + TT
RSRP Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-81.75 + TT	-81.75 + TT	-108.70 + TT	-108.70 + TT	-123.50 + TT	-123.50 + TT
	Bands 2, 5, 7 and 11						-121.50 + TT	-121.50 + TT
	Bands 3, 8, 13, …						-120.50 + TT	-120.50 + TT
	Band 9						-122.50 + TT	-122.50 + TT
RSRQ Note3	Bands 1, 4, 6, 10, 18 and 19	dB	-14.76 + TT	-14.76 + TT	-16.76 + TT	-16.76 + TT	-16.61 + TT	-16.61 + TT
	Bands 2, 5, 7 and 11							
	Bands 3, 8, 13, …							
	Band 9							
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-50 + TT	-50 + TT	-74.95 + TT	-74.95 + TT	-89.90 + TT	-89.90 + TT
	Bands 2, 5, 7 and 11						-87.90 + TT	-87.90 + TT
	Bands 3, 8, 13, …						-86.90 + TT	-86.90 + TT
	Band 9						-88.90 + TT	-88.90 + TT
$\hat{E}_s/N_{oc}$		dB	-1.75 + TT	-1.75 + TT	-4.7 + TT	-4.7 + TT	-4.5 + TT	-4.5 + TT
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_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS

9.2.3.2 FDD – FDD Inter Frequency Relative Accuracy of RSRQ

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*
- *The RSRQ FDD – FDD inter frequency relative accuracy test requirements for the reported values are undefined*

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 Band 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 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, 11, 17,

$RSRP1|_{dBm} \geq$ -124 dBm if RSRP1 is on Bands 3, 8, 12, 13, 14,

$RSRP2|_{dBm} \geq$ -127 dBm if RSRP2 is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 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, 11, 17,

$RSRP2|_{dBm} \geq$ -125 dBm if RSRP2 is on Bands 3, 8, 12, 13, 14.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

| 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	RSRQ is on Bands 2, 5, 7, 11, 17	RSRQ is on Bands 3, 8, 12, 13, 14	RSRQ is on Band 9
				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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.
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. According to Table 9.2.3.2.5-3 the SS shall calculate the actual RSRQ power as defined in TS 36.214 [12] clause 5.1.3 of Cell 1 and Cell 2. The reported RSRQ value for Cell 1 is compared to the reported RSRQ value for Cell 2 for each MeasurementReport message.
7. The result from the power level difference of the RSRQ value reported from Cell 1 compared to Cell 2 in step 6) is compared to the actual power level difference of RSRQ for Cell 1 and Cell 2.
8. 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.
9. Repeat step 1-8 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.3.2-1 Table H.3.5-2 Table H.3.5-4

Table 9.2.3.2.4.3-2: *MeasuredResults*: Additional RSRQ FDD – FDD inter frequency relative 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			
rsrpResult		Set according to specific tes	
rsrqResult		Set according to specific tes	
},			
neighbouringMeasResults 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
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 accuracy test requirements in Table 9.2.3.2.5-1.

The RSRQ FDD – FDD inter frequency relative accuracy test for the reported values shall meet the requirements in Table 9.2.3.2.5-3.

Table 9.2.3.2.5-1: RSRQ FDD – FDD inter frequency relative accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	RSRQ is on Bands 2, 5, 7, 11, 17	RSRQ is on Bands 3, 8, 12, 13, 14	RSRQ is on Band 9
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 3 + TT	± 4 + TT	-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	± 4 + TT	± 4 + TT	-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.

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
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, 18 and 19	dBm/15 kHz	-80 + TT	-80 + TT	-104 + TT	-104 + TT	-119 + TT	-119 + TT
	Bands 2, 5, 7 and 11						-117 + TT	-117 + TT
	Bands 3, 8, 13, …						-116 + TT	-116 + TT
	Band 9						-118 + TT	-118 + TT
$\hat{E}_s/I_{ot}$		dB	-1.75 + TT	-1.75 + TT	-4.7 + TT	-4.7 + TT	-4.5 + TT	-4.5 + TT
RSRP Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/15 kHz	-81.75 + TT	-81.75 + TT	-108.70 + TT	-108.70 + TT	-123.50 + TT	-123.50 + TT
	Bands 2, 5, 7 and 11						-121.50 + TT	-121.50 + TT
	Bands 3, 8, 13, …						-120.50 + TT	-120.50 + TT
	Band 9						-122.50 + TT	-122.50 + TT
RSRQ Note3	Bands 1, 4, 6, 10,18 and 19	dB	-14.76 + TT	-14.76 + TT	-16.76 + TT	-16.76 + TT	-16.61 + TT	-16.61 + TT
	Bands 2, 5, 7 and 11							
	Bands 3, 8, 13, …							
	Band 9							
Io Note3	Bands 1, 4, 6, 10, 18 and 19	dBm/9 MHz	-50 + TT	-50 + TT	-74.95 + TT	-74.95 + TT	-89.90 + TT	-89.90 + TT
	Bands 2, 5, 7 and 11						-87.90 + TT	-87.90 + TT
	Bands 3, 8, 13, …						-86.90 + TT	-86.90 + TT
	Band 9						-88.90 + TT	-88.90 + TT
$\hat{E}_s/N_{oc}$		dB	-1.75 + TT	-1.75 + TT	-4.7 + TT	-4.7 + TT	-4.5 + TT	-4.5 + TT
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 – FFS)	RSRQ_(x - FFS)	RSRQ_(x - FFS)
Highest reported value (Cell 2)	RSRQ_(x + FFS)	RSRQ_(x + FFS)	RSRQ_(x + FFS)
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_(x - FFS)	RSRQ_(x - FFS)	RSRQ_(x - FFS)
Highest reported value (Cell 2)	RSRQ_(x + FFS)	RSRQ_(x + FFS)	RSRQ_(x + FFS)
RSRQ_x is the reported value of Cell 1			

9.2.4 TDD Inter frequency RSRQ Accuracy

9.2.4.1 TDD Inter Frequency Absolute RSRQ 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*

9.2.4.1.1 Test purpose

To verify that the 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 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, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm≥ -126 dBm for Bands 9,

$RSRP|_{dBm}$≥ -125 dBm for Bands 2, 5, 7, 11, 17

$RSRP|_{dBm}$≥ -124 dBm for Bands 3, 8, 12, 13, 14

Table 9.2.3.1.3-1: RSRQ FDD inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Bands 9
				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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS.

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 SS shall calculate the actual RSRQ power value of Cell 2 as defined in TS 36.214 [12] clause 5.1.3 which is compared to the reported RSRQ value from the same Cell 2 for each MeasurementReport message 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.

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: *RRCConnectionReconfiguration*: Additional RSRQ TDD inter frequency absolute accuracy 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 9.2.4.1.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional RSRQ TDD inter frequency absolute accuracy test requirement

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	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 9.2.4.1.4.3-3: *ReportConfigEUTRA-PERIODICAL*: Additional RSRQ FDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose CHOICE {			
reportStrongestCells	NULL		
}			
}			
}			
triggerQuantity	Rsrq		
reportQuantity	Both		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

Table 9.2.4.1.4.3-4: *MeasuredResults*: Additional RSRQ TDD inter frequency absolute accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	[1]		
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.2.4.1.4.3-5: *MeasResultListEUTRA*: Additional RSRQ 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
Tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
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 accuracy test requirements in Table 9.2.4.1.5-1.

The RSRQ TDD inter frequency absolute accuracy test for the reported values shall meet the requirements in Table 9.2.4.2.5-3.

Table 9.2.4.1.5-1: RSRQ TDD inter frequency absolute accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7, 11, 17	Bands 3, 8, 12, 13, 14	Bands 9
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 2.5 + TT	± 4 + TT	-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 + TT	± 4 + TT	-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.							

Table 9.2.4.1.5-2: Cell Specific Test requirement Parameters for RSRQ 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
Measurement gap configuration			6	-	6	-		-
Special subframe configuration Note1			0		0		0	
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+ TT	-80+ TT	-104+ TT	-104+ TT	-119+ TT	-119+ TT
Ês/Iot		dB	-1.75+ TT	-1.75+ TT	-4.7+ TT	-4.7+ TT	-4.5+ TT	-4.5+ TT
RSRP Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.75+ TT	-81.75+ TT	-108.70+ TT	-108.70+ TT	-123.50+ TT	-123.50+ TT
RSRQ Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.76+ TT	-14.76+ TT	-16.76+ TT	-16.76+ TT	-16.61+ TT	-16.61+ TT
Io Note4	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50+ TT	-50+ TT	-74.95+ TT	-74.95+ TT	-89.90+ TT	-89.90+ TT
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 inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS
Highest reported value (Cell 2)	RSRQ_FFS	RSRQ_FFS	RSRQ_FFS

9.2.4.2 TDD Inter Frequency Relative Accuracy of RSRQ

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*

9.2.4.2.1 Test purpose

To verify that the TDD inter 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 Band 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 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, 11, 17,

$RSRP1|_{dBm} \geq$ -124 dBm if RSRP1 is on Bands 3, 8, 12, 13, 14,

$RSRP2|_{dBm} \geq$ -127 dBm if RSRP2 is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 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, 11, 17,

$RSRP2|_{dBm} \geq$ -125 dBm if RSRP2 is on Bands 3, 8, 12, 13, 14.

$$\left| RSRP1|_{dBm} - RSRP2|_{dBm} \right| \leq [27] dB$$

| Channel 1_Io -Channel 2_Io | ≤ [20] dB

Table 9.2.3.2.3-1: RSRQ TDD Tinter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	RSRQ is on Bands 2, 5, 7, 11, 17	RSRQ is on Bands 3, 8, 12, 13, 14	RSRQ is on Band 9
				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: 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 9.1.6.2 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 4 according to TS 36.508 [7] clause 4.5.4 and receiving payload data from the SS .

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 SS shall calculate the actual RSRQ power as defined in TS 36.214 [12] clause 5.1.3 of Cell 1 and Cell 2. The reported RSRQ value for

Cell 1 is compared to the reported RSRQ value for Cell 2 for each MeasurementReport message according to Table 9.2.4.2.5-3.

7. The result from the power level difference of the RSRQ value reported from Cell 1 compared to Cell 2 in step 6) is compared to the actual power level difference of RSRQ for Cell 1 and Cell 2..

8. 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.

9. Repeat step 1-8 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: *RRCConnectionReconfiguration*: Additional RSRQ TDD inter frequency relative accuracy 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 {			
measurementConfiguration			
	MeasurementConfiguration-DEFAULT		MEAS

Table 9.2.4.2.4.3-2: *MeasurementConfiguration-DEFAULT*: Additional RSRQ TDD inter frequency relative accuracy test requirement

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	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModifyList	Not present		
quantityConfig	Not present		
measGapConfig	MeasGapConfig-GP1		
s-Measure	Not present		
hrpd-PreRegistrationInfo	Not present		
mbsfn-NeighbourCellConfig	Not present		
speedDependentParameters	Not present		
}			

Table 9.2.4.2.4.3-3: *ReportConfigEUTRA-PERIODICAL*: Additional RSRQ FDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose CHOICE {			
reportStrongestCells	NULL		
}			
}			
}			
triggerQuantity	rsrq		
reportQuantity	both		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	infinity		
}			

Table 9.2.4.1.4.3-4: *MeasuredResults*: Additional RSRQ TDD inter frequency relative accuracy test requirement

Derivation Path: 36.331 clause 6.3.5			
Information Element	**Value/remark**	**Comment**	**Condition**
MeasuredResults ::= SEQUENCE {			
measId	[1]		
measResultsServing			
rsrpResult		Set according to specific test	
rsrqResult		Set according to specific test	
},			
neighbouringMeasResults CHOICE {			
measResultListEUTRA	MeasResultListEUTRA		
…			
}			
…			
}			

Table 9.2.4.1.4.3-5: *MeasResultListEUTRA*: Additional RSRQ 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 {			
physicalCellIdentity	PhysicalCellIdentity		
globalCellIdentity SEQUENCE {			
globalCellID-EUTRA	GlobalCellId-EUTRA		
tac-ID	TrackingAreaCode		
plmn-IdentityList	Not present		
}			
measResult SEQUENCE {			
rsrpResult		Set according to specific test	
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 accuracy test requirements in Table 9.2.4.2.5-1.

The RSRQ TDD inter frequency relative accuracy test for the reported values shall meet the requirements in Table 9.2.4.2.5-3.

Table 9.2.4.2.5-1: RSRQ TDD inter frequency relative accuracy, test requirements

Parameter	Unit	Accuracy [dB]		Conditions[1]			
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 18, 19, 33, 34, 35, 36, 37, 38, 39, 40	RSRQ is on Bands 2, 5, 7, 11, 17	RSRQ is on Bands 3, 8, 12, 13, 14	RSRQ is on Band 9
				Io	Io	Io	Io
RSRQ when RSRP Ês/Iot > -3 dB	dBm	± 3 + TT	± 4 + TT	-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	± 4 + TT	± 4 + TT	-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.							

Table 9.2.4.2.5-2: Cell Specific Test requirement Parameters for RSRQ 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
Measurement gap configuration			6	-	6	-		-
Special subframe configuration [Note1]			0		0		0	
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+TT	-80+TT	-104+TT	-104+TT	-119+TT	-119+TT
Ês/Iot		dB	-1.75+TT	-1.75+TT	-4.7+TT	-4.7+TT	-4.5+TT	-4.5+TT
RSRP [Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.75+TT	-81.75+TT	-108.70+TT	-108.70+TT	-123.50+TT	-123.50+TT
RSRQ [Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.76+TT	-14.76+TT	-16.76+TT	-16.76+TT	-16.61+TT	-16.61+TT
Io [Note4]	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50+TT	-50+TT	-74.95+TT	-74.95+TT	-89.90+TT	-89.90+TT
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 inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
Normal Conditions			
Lowest reported value (Cell 2)	RSRQ_(x - FFS)	RSRQ_(x - FFS)	RSRQ_(x - FFS)
Highest reported value (Cell 2)	RSRQ_(x + FFS)	RSRQ_(x + FFS)	RSRQ_(x + FFS)
Extreme Conditions			
Lowest reported value (Cell 2)	RSRQ_(x - FFS)	RSRQ_(x - FFS)	RSRQ_(x - FFS)
Highest reported value (Cell 2)	RSRQ_(x + FFS)	RSRQ_(x + FFS)	RSRQ_(x + FFS)
RSRQ_x is the reported value of Cell 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.0 FDD]	[R.1 FDD]	
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas					1	2	
Allocated resource blocks					24	24	
Allocated subframes per Radio Frame					10	10	
Modulation					QPSK	QPSK	
Target Coding Rate					1/3	1/3	
Information Bit Payload							
For Sub-Frames 4, 9	Bits				2088	2088	
For Sub-Frame 5	Bits				2088	1736	
For Sub-Frame 0	Bits				1736	1736	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits				0	0	
Number of Code Blocks per subframe					1	1	
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4, 9	Bits				6624	6336	
For Sub-Frame 5	Bits				6336	6048	
For Sub-Frame 0	Bits				5784	5520	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits				0	0	
Max. Throughput averaged over 1 frame	kbps				800	765	
Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [16]. 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 [3].							

A.1.2 TDD

Table A.1.2-1: PDSCH Reference Measurement Channels for TDD

Parameter	Unit	Value					
Reference channel					[R.0 TDD]	[R.1 TDD]	
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas					1	2	
Allocated resource blocks					24	24	
Allocated subframes per Radio Frame					6	6	
Modulation					QPSK	QPSK	
Target Coding Rate					1/3	1/3	
Information Bit Payload							
For Sub-Frames 4,9	Bits				2088	2088	
For Sub-Frame 5	Bits				2088	2088	
For Sub-Frame 0	Bits				2088	1736	
For Sub-Frame 1, 6 (DwPTS)	Bits				1288	1064	
Number of Code Blocks per subframe					1	1	
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4,9	Bits				6624	6336	
For Sub-Frame 5	Bits				6480	6192	
For Sub-Frame 0	Bits				5928	5640	
For Sub-Frame 1, 6 (DwPTS)	Bits				3696	3504	
Max. Throughput averaged over 1 frame	Mbps				1.09	1.01	

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW
Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [16].
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 [3].

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.6 FDD]**	**[R.7 FDD]**	
Channel bandwidth	**MHz**				**10**	**10**	
Number of transmitter antennas	**MHz**				**1**	**2**	
Control region OFDM symbolsNote1	**symbols**				**2**	**2**	
Aggregation level	**CCE**				**8**	**8**	
DCI Format					**Note 3**	**Note 3**	
Cell ID					**Note 4**	**Note 4**	
Payload (without CRC)	**Bits**				**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.

A.2.2 TDD

Table A.2.2-1: PCFICH/PDCCH/PHICH Reference Channel for TDD

Parameter	Unit	Value					
Reference channel					**[R.6 TDD]**	**[R.7 TDD]**	
Channel bandwidth	**MHz**				**10**	**10**	
Number of transmitter antennas	**MHz**				**1**	**2**	
Control region OFDM symbols [Note1]	**symbols**				**2**	**2**	
Aggregation level	**CCE**				**8**	**8**	
DCI Format					**Note 3**	**Note 3**	
Cell ID					**Note 4**	**Note 4**	
Payload (without CRC)	**Bits**				**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.

Annex B (normative): Propagation Conditions

See TS 36.521-1[10] Annex B.

Annex C (normative): Downlink Physical Channels

C.0 Downlink signal levels

See TS 36.521-1[10] Annex C.0

C.1 General

This annex specifies the downlink physical channels that are needed for setting up a connection.

Table C.1-1 is applicable for connection setup and registration for all RRM tests.

Table C.1-1: Downlink Physical Channels transmitted during connection setup (FDD and TDD)

Physical Channel	EPRE Ratio	
PBCH	**PBCH_RA = 0 dB**	
	PBCH_RB = 0 dB	
PSS	**PSS_RA = 0 dB**	
SSS	**SSS_RA = 0 dB**	
PCFICH	**PCFICH_RB = 0 dB**	
PDCCH	**PDCCH_RA = 0 dB**	
	PDCCH_RB = 0 dB	
PDSCH	**PDSCH_RA = 0 dB**	
	PDSCH_RB = 0 dB	
PHICH	**PHICH_RA = 0 dB**	
	PHICH_RB = 0 dB	
Note: No boosting is applied.		

Annex D (normative): OFDMA Channel Noise Generator (OCNG)

D.1 OCNG Patterns for FDD

D.1.1 OCNG FDD pattern 1: outer resource blocks allocation

Table D.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

Allocation n_{PRB}	**CP length**	**Relative power level γ_{PRB} [dB]**											**PDSCH Data**	**PMCH Data**
		Subframe												
		0			5			4,9			1-3, 6-8			
		Control region OFDM symbols[Note 2]												
		1	2	3	1	2	3	1	2	3	1	2		
0 – 12	N	0			0			0			N/A		Note 1	N/A
37 – 49	N	0			0			0			N/A			
0-49	N	N/A			N/A			N/A			0		N/A	Note 3

Note 1: Each physical resource block (PRB) is assigned to an individual virtual UE. The data for each virtual UE shall be uncorrelated with data from other virtual UEs over the period of any measurement. The data shall be QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.

Note 3: 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 4: If two or more transmit antennas are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas and according to the antenna transmission mode used for the UE under test. The transmit power shall be equally split between all the transmit antennas used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N: Normal
N/A: Not Applicable

D.1.2 OCNG FDD pattern 2: full bandwidth allocation

Table D.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

Allocation n_{PRB}	**CP length**	**Relative power level γ_{PRB} [dB]**											**PDSCH Data**	**PMCH Data**
		Subframe												
		0			5			4, 9			1 – 3, 6 – 8			
		Control region OFDM symbols[Note 2]												
		1	2	3	1	2	3	1	2	3	1	2		

0 – 49	N	0	0	0	N/A	Note 1	N/A
0 – 49	N	N/A	N/A	N/A	0	N/A	Note 3

Note 1: Each physical resource block (PRB) is assigned to an individual virtual UE. The data for each virtual UE shall be uncorrelated with data from other virtual UEs over the period of any measurement. The data shall be QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: The control region consists of PCFICH, PHICH and PDCCH. Number of OFDM symbols belonging to the control region may vary between subframes.

Note 3: 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 4: If two or more transmit antennas are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas and according to the antenna transmission mode used for the UE under test. The transmit power shall be equally split between all the transmit antennas used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N: Normal
N/A: Not Applicable

D.2 OCNG Patterns for TDD

D.2.1 OCNG TDD pattern 1: outer resource blocks allocation

Table D.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**CP length**	**Relative power level** γ_{PRB} **[dB]**											**PDSCH Data**
		Subframe											
		0			5			3, 4, 8, 9[Note 2]			1, 6		
		Control region OFDM symbols[Note 3]											
		1	2	3	1	2	3	1	2	3	1	2	
0 – 12	N	0			0			0			Table D.2.1-2		Note 1
37 – 49	N	0			0			0					

Note 1: Each physical resource block (PRB) is assigned to an individual virtual UE. The data for each virtual UE shall be uncorrelated with data from other virtual UEs over the period of any measurement. The data shall be QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].

Note 3: 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 are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas and according to the antenna transmission mode used for the UE under test. The transmit power shall be equally split between all the transmit antennas used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N: Normal

Table D.2.1-2: OP.1 TDD: OCNG TDD Pattern 1 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 12	N	0		0		0		0		0		0		0		0		0	
37 – 49	N	0		0		0		0		0		0		0		0		0	

Note: Special subframe configurations are defined in Table 4.2-1 in TS 36.211 [16].

D.2.2 OCNG TDD pattern 2: full bandwidth allocation

Table D.2.2-1: OP.2 TDD: OCNG TDD Pattern 2 for 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	CP length	Relative power level γ_{PRB} [dB]											PDSCH Data
		Subframe											
		0			5			3 , 4, 8, 9 Note 2			1, 6		
		Control region OFDM symbols Note 3											
		1	2	3	1	2	3	1	2	3	1	2	
0 – 49	N	0			0			0			Table D.2.2-2		Note 1

Note 1: Each physical resource block (PRB) is assigned to an individual virtual UE. The data for each virtual UE shall be uncorrelated with data from other virtual UEs over the period of any measurement. The data shall be QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].

Note 3: 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 are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas and according to the antenna transmission mode used for the UE under test. The transmit power shall be equally split between all the transmit antennas used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N: Normal

Table D.2.2-2: OP.2 TDD: OCNG TDD Pattern 2 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation n_{PRB}	**CP length**	**Relative power level γ_{PRB} [dB]**																	
		Special subframe configuration																	
		0		1		2		3		4		5		6		7		8	
		Control region OFDM symbols																	
		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 49	N	0		0		0		0		0		0		0		0		0	
Note: Special subframe configurations are defined in Table 4.2-1 in 3GPP TS 36.211 [16].																			

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	Cell2		
4.2.2	RRC IDLE / E-UTRAN Cell Reselection / TDD – TDD cell re-selection intra frequency case	Cell1	Cell2		
4.2.3	RRC IDLE / E-UTRAN Cell Reselection / FDD – FDD cell re-selection inter frequency case	Cell1	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	Cell1	Cell23		
4.2.6	RRC IDLE / E-UTRAN Cell Reselection / TDD – TDD cell re-selection inter frequency case	Cell1	Cell23		
4.3.1	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD – UTRAN FDD cell re-selection	Cell1	Cell5		
4.3.2	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN FDD – UTRAN TDD cell re-selection	Cell1	Cell5		
4.3.3	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD – UTRAN FDD cell re-selection	Cell1	Cell5		
4.3.4	RRC IDLE / E-UTRAN to UTRAN Cell re-selection / E-UTRAN TDD – UTRAN TDD cell re-selection	Cell1	Cell5		
4.4.1	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN FDD – GSM cell re-selection	Cell1	[TBD]		
4.4.2	RRC IDLE / E-UTRAN to GSM Cell re-selection / E-UTRAN TDD – GSM cell re-selection	Cell1	[TBD]		
4.5.1	RRC IDLE / E-UTRAN to HRPD Cell re-selection / E-UTRAN FDD – HRPD cell re-selection				
4.6.1	RRC IDLE / E-UTRAN to cdma2000 1xRTT Cell re-selection / E-UTRAN FDD – cdma2000 1xRTT cell re-selection				
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	Cell1	Cell3		
5.1.4	RRC CONNECTED / E-UTRAN Handover / TDD – TDD / Inter frequency case	Cell1	Cell3		
5.2.1	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD – UTRAN FDD handover	Cell1	Cell5		
5.2.2	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to UTRAN / E-UTRAN FDD – UTRAN TDD handover	Cell1	Cell5		
5.2.3	RRC CONNECTED / Handover from E-UTRAN to other RATs / From E-UTRAN to GSM / E-UTRAN FDD – GSM handover	Cell1	[TBD]		
6.1.1	RRC Connection Mobility Control / RRC Re-establishment to E-UTRAN				
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			
7.2.1	E-UTRAN TDD-UE Timing Advance Adjustment Accuracy	Cell1			
7.3.1	E-UTRAN FDD-UE Radio Link Monitoring Test for Out-of-sync	Cell1			
7.3.2	E-UTRAN FDD-UE Radio Link Monitoring Test for In-of-sync	Cell1			
7.3.3	E-UTRAN TDD-UE Radio Link Monitoring Test for Out-of-sync	Cell1			
7.3.4	E-UTRAN TDD-UE Radio Link Monitoring Test for In-of-sync	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		
8.2.2	UE Measurement Procedures / E-UTRAN TDD-TDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell2		
8.3.1	UE Measurement Procedures / E-UTRAN FDD-FDD inter	Cell1	Cell3		

	frequency event triggered reporting under fading propagation conditions in asynchronous cells				
8.4.1	UE Measurement Procedures / E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Cell1	Cell3		
8.5.1	UE Measurement Procedures / E-UTRAN FDD – UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell5		
8.6.1	UE Measurement Procedures / E-UTRAN TDD – UTRAN FDD event triggered reporting under fading propagation conditions	Cell1	Cell5		
8.7.1	UE Measurement Procedures / E-UTRAN TDD – UTRAN TDD event triggered reporting under fading propagation	Cell1	Cell5		
8.9.1	UE Measurement Procedures / E-UTRAN FDD – UTRAN TDD event triggered reporting under fading propagation conditions	Cell1	Cell5		
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 Intra Frequency RSRP Accuracy / Relative	Cell1	Cell2		
9.1.3.1	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Absolute	Cell1	Cell3		
9.1.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRP Accuracy / Relative	Cell1	Cell3		
9.1.4.1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Absolute	Cell1	Cell3		
9.1.4.2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRP Accuracy / Relative	Cell1	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	Cell1	Cell3		
9.2.3.2	Measurement Performance Requirements / E-UTRAN / FDD Inter frequency RSRQ Accuracy / Relative	Cell1	Cell3		
9.2.4.1	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRQ Accuracy / Absolute	Cell1	Cell3		
9.2.4.2	Measurement Performance Requirements / E-UTRAN / TDD Inter Frequency RSRQ Accuracy / Relative	Cell1	Cell3		

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
[TBD]	[TBD]	[TBD]

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

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
[TBD]	[TBD]	[TBD]	[TBD]

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%).

Among the statistical tests there are tests performed in fading conditions while others are performed in static conditions. In addition to the statistical considerations, the fading conditions require the definition of a minimum test time.

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

3) To decide the test pass:

Supplier risk is applied based on the bad DUT quality

To decide the test fail

Cusomer 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 Minimum Test time

The minimum test time applies for tests under fading conditions. If a pass fail decision in G.2.4 can be achieved earlier than the minimum test time, then the test shall not be decided, but continued until the minimum test time is elapsed. For tests under static conditions, the pass fail decision in G.2.4 is not restricted.

Table G.2.5-1: Minimum Test time

Δf doppler max	**Minimum test time in sec (note1)**						
BW	SPR	1.4 MHz	3MHz	5MHz	10MHz	15 MHz	20 MHz
5 Hz	Tbd	tbd	tbd	[198]	tbd	tbd	tbd
70 Hz	Tbd	tbd	tbd	[14.1]	tbd	tbd	tbd
300 Hz	Tbd	tbd	tbd	[3.3]	tbd	tbd	tbd
Note: The minimum test time is the net test time. Time periods consumed in between test repetitions are not considerd as test time.							

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**
4.2.1 EUTRAN FDD-FDD cell re-selection intra frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
4.2.2 E-UTRAN TDD – TDD cell re-selection intra frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
4.2.3 E-UTRAN FDD – FDD cell re-selection inter frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
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	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
4.3.1 E-UTRAN FDD – UTRAN FDD cell re-selection				
4.3.2 E-UTRAN FDD – UTRAN TDD cell re-selection				
4.3.3 E-UTRAN TDD – UTRAN FDD cell re-selection				

4.3.4 E-UTRAN TDD – UTRAN TDD cell re-selection				
4.4.1 E-UTRAN FDD – GSM cell re-selection	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
4.4.2 E-UTRAN TDD – GSM cell re-selection				
4.5.1 E-UTRAN FDD – HRPD Cell re-selection				
4.6.1 E-UTRAN FDD – cdma2000 1xRTT Cell re-selection				
5.1.1 E-UTRAN FDD-FDD Handover intra frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.1.2 E-UTRAN TDD-TDD Handover intra frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.1.3 E-UTRAN FDD-FDD Handover inter frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.1.4 E-UTRAN TDD-TDD Handover inter frequency case	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.2.1 E-UTRAN FDD – UTRAN FDD handover	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.2.2 E-UTRAN FDD – UTRAN TDD handover	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.2.3 E-UTRAN FDD – GSM handover	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test vector must pass
5.2.4 E-UTRAN TDD	Test procedure ensures independency	1 per operating band	NA	To pass the test, all components in the test

– UTRAN TDD handover				vector must pass
5.3.1 Inter-RAT Handover from E-UTRAN to HRPD				
5.3.2 Inter-RAT Handover from E-UTRAN to cdma2000 1xRTT				
6.1.1 RRC Re-establishment to E-UTRAN				
8.1.1 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in asynchronous cells	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.1.2 E-UTRAN FDD-FDD intra frequency event triggered reporting under fading propagation conditions in synchronous cells	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass

8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.5.1 E-UTRAN FDD – UTRAN FDD event triggered reporting under fading propagation conditions	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.6.1 E-UTRAN TDD – UTRAN FDD event triggered reporting under fading propagation conditions	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.7.1 E-UTRAN TDD – UTRAN TDD event triggered reporting under fading propagation conditions	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
8.8				
8.9.1 E-UTRAN FDD – UTRAN TDD event triggered reporting under fading propagation conditions	Test procedure ensures independency	1 per operating band	Table G.5.2 applies	To pass the test, all components in the test vector must pass
9.1.1.1 FDD Intra Frequency Absolute RSRP Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.1.1.2 FDD Intra Frequency Relative Accuracy of RSRP	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.1.2.1 TDD Intra Frequency Absolute RSRP Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.1.2.2 TDD Intra	Independency is assumed, although Layer 1 filtering is	Full set of environmental	NA	To pass the test, all components in the test

Frequency Relative Accuracy of RSRP	applied to the reported results	conditions (5) per operating band		vector must pass
9.1.3.1 FDD -FDD Inter Frequency Absolute RSRP Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.1.3.2 FDD -FDD Inter Frequency Relative Accuracy of RSRP	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.1.4.1 TDD -TDD Inter Frequency Absolute RSRP Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.1.4.2 TDD -TDD Inter Frequency Relative Accuracy of RSRP	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.2.1.1 FDD Intra Frequency Absolute RSRQ Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.2.2.1 TDD Intra Frequency Absolute RSRQ Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.2.3.1 FDD -FDD Inter Frequency Absolute RSRQ Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.2.3.2 FDD -FDD Inter Frequency Relative Accuracy of RSRQ	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.2.4.1 TDD Inter Frequency Absolute RSRQ Accuracy	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass
9.2.4.2 TDD Inter Frequency Relative Accuracy of RSRQ	Independency is assumed, although Layer 1 filtering is applied to the reported results	Full set of environmental conditions (5) per operating band	NA	To pass the test, all components in the test vector must pass

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

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 {			
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)	

SystemInformationBlockType5: (FDD/TDD) for E-UTRAN inter-frequency cell re-selection case

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	Conditi
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)	

H.2.3 System information blocks message contents exceptions for E-UTRAN inter-RAT cell re-selection

SystemInformationBlockType3: (FDD) for inter-RAT EUTRAN FDD - UTRA is of higher priority cell re-selection

Table H.2.3-1: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD – UTRA 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: (FDD) for inter-RAT EUTRAN FDD - UTRA is of higher priority cell re-selection

Table H.2.3-2: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD – UTRA 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
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)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 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: (TDD) for inter-RAT EUTRAN TDD - UTRA is of higher priority cell re-selection

Table H.2.3-3: *SystemInformationBlockType3*: Inter-RAT E-UTRAN TDD – UTRA 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: (TDD) for inter-RAT EUTRAN TDD - UTRA is of higher priority cell re-selection

Table H.2.3-4: *SystemInformationBlockType6*: Inter-RAT E-UTRAN TDD – UTRA 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
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
…			
threshX-High	12 (24 dB)	24 is actual value in dB (12 * 2 dB)	
threshX-Low	25 (50 dB)	50 is actual value in dB (25 * 2 dB)	
q-RxLevMin	-52 (-103 dBm)	-103 is actual value in dBm (-52 * 2 + 1 dBm)	
p-MaxUTRA	21 (21 dBm)		
q-QualMin	-20 (-20 dB)		
}			

SystemInformationBlockType3: (FDD) for inter-RAT EUTRAN FDD - UTRA is of lower priority cell re-selection

Table H.2.3-5: *SystemInformationBlockType3*: Inter-RAT E-UTRAN FDD – UTRA 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: (FDD) for inter-RAT EUTRAN FDD - UTRA is of lower priority cell re-selection

Table H.2.3-6: *SystemInformationBlockType6*: Inter-RAT E-UTRAN FDD – UTRA 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
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
…			
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
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: (TDD) for inter-RAT EUTRAN TDD - UTRA is of lower priority cell re-selection

Table H.2.3-7: *SystemInformationBlockType3*: Inter-RAT E-UTRAN TDD – UTRA 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: (TDD) for inter-RAT EUTRAN TDD - UTRA is of lower priority cell re-selection

Table H.2.3-8: *SystemInformationBlockType6*: Inter-RAT E-UTRAN TDD – UTRA 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
CarrierFreqListUTRA-FDD ::= SEQUENCE (SIZE (1..maxUTRA-FDD-Carrier)) OF SEQUENCE {			UTRA-FDD
…			
threshX-High	24 (48 dB)	48 is actual value in dB (24 * 2 dB)	
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)		
q-QualMin	-20 (-20 dB)		
}			

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 4.4.3.3-3 SystemInformationBlockType7			
Information Element	Value/remark	Comment	Condition
commonInfo SEQUENCE {			
cellReselectionPriority	0		
ncc-Permitted	"11111111'B		
q-RxLevMin	-70 (-140 dBm)	-140 is actual value in dBm (-70 * 2 dBm)	
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)	

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 {			
t310	ms0		
t311	ms1000		
n310	n1		
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 {			
t310	[ms2000]		
t311	ms1000		
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

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		

RRCConnectionReconfiguration: (FDD/TDD) to setup E-UTRAN intra frequency and inter frequency handover

Table H.3.2-3: *RRCConnectionReconfiguration*: E-UTRAN handover

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	Present		
	MobilityControlInfo-HO		HO

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: 36.331 clause 6.2.2			
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-SRB1-SRB2-DRB(n, m)		SRB1-SRB2-DRB(n,m)

PhysicalConfigDedicated-DEFAULT: (FDD/TDD) for E-UTRAN Physical Configuration

Table H.3.4-2: *PhysicalConfigDedicated-DEFAULT*: E-UTRAN Physical Configuration

Derivation Path: 36.331 clause 6.3.2			
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*: 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	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	Not present		
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*: 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	Not present		
reportConfigToRemoveList	Not present		
reportConfigToAddModList	ReportConfigEUTRA-PERIODICAL		
measIdToRemoveList	Not present		
measIdToAddModList	Not present		
quantityConfig	Not present		
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: 36.331 clause 6.3.5			
Information Element	Value/remark	Comment	Condition
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose CHOICE {			
reportStrongestCells	NULL		
}			
}			
}			
triggerQuantity	Rsrp		
reportQuantity	Both		
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: 36.331 clause 6.3.5			
Information Element	Value/remark	Comment	Condition
ReportConfigEUTRA-PERIODICAL ::= SEQUENCE {			
triggerType CHOICE {			
periodical SEQUENCE {			
purpose CHOICE {			
reportStrongestCells	NULL		
}			
}			
}			
triggerQuantity	Rsrq		
reportQuantity	Both		
maxReportCells	1		
reportInterval	ms1024 (1024 ms)		
reportAmount	Infinity		
}			

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 R5-086142 Measurement Reference Channels and OCNG for RRM testing	0.5.0	0.6.0

					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 measruement accuracy TDD R5-091090 Intra-frequency Relative RSRP measruement 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	0.6.0	1.0.0

					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		
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 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-	1.0.0	1.1.0

					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	1.1.0	2.0.0

					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 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

History

Document history		
V8.0.1	June 2009	Publication