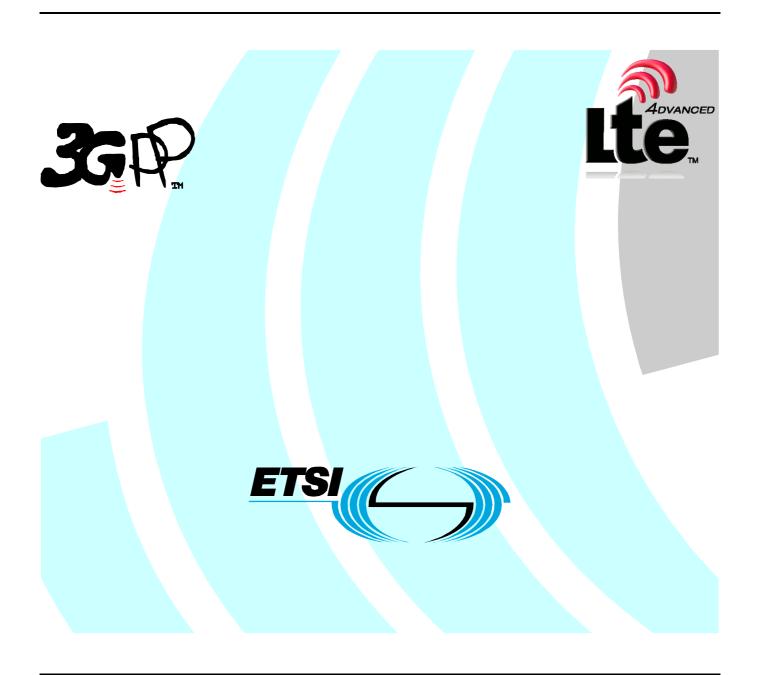
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Foreword

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

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

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document specifies requirements for support of Radio Resource Management for the FDD and TDD modes of Evolved UTRA. These requirements include requirements on measurements in UTRAN and the UE as well as requirements on node dynamical behaviour and interaction, in terms of delay and response characteristics.

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.

Modulation"

• 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*.

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[1]	3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode"
[2]	3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".
[3]	3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures"
[4]	3GPP TS 36.214: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer; Measurements"
[5]	3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception"
[6]	3GPP TS 25.302: "Services provided by the Physical Layer".
[7]	3GPP TS 25.331: "RRC Protocol Specification".
[8]	3GPP TS 45.008: "Radio subsystem link control".
[9]	3GPP TS 45.005: "Radio transmission and reception".
[10]	3GPP TS 45.010: "Radio subsystem synchronization".
[11]	3GPP2 C.S0024-B: "cdma2000 High Rate Packet Data Air Interface Specification".
[12]	3GPP2 C.S0002-D: "Physical Layer Standard for cdma2000 Spread Spectrum Systems – Release A".
[13]	3GPP2 C.S0033-B: "Recommended Minimum Performance Standards for cdma2000 High Rate Packet Data Access Terminal".
[14]	3GPP2 C.S0011-C: "Recommended Minimum Performance Standards for cdma2000 Spread Spectrum Mobile Stations".
[15]	3GPP2 C.S0005-D: Upper Layer (Layer 3) Signaling Specification for cdma2000 Spread Spectrum Systems
[16]	3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and

[17]	3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".
[18]	3GPP TS 25.133: "Requirements for Support of Radio Resource Management (FDD)".
[19]	3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".
[20]	3GPP TS 25.214: "Physical layer procedures (FDD)".
[21]	3GPP TS 36. 212 "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding".
[22]	3GPP TS 36.302: "Evolved Universal Terrestrial Radio Access (E-UTRA); Services provided by the physical layer"
[23]	3GPP TS 36.521-3: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) conformance specification; Radio transmission and reception; Part 3: Radio Resource Management conformance testing".
[24]	3GPP TS 36.355: "Evolved Universal Terrestrial Radio Access (E-UTRA); LTE Positioning Protocol (LPP)".
[25]	3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2"
[26]	3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
[27]	3GPP TS 37.320: "Universal Terrestrial Radio Access (UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRA); Radio measurement collection for Minimization of Drive Tests (MDT); Overall description; Stage 2"

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [26] 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 [26].

3.2 Symbols

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

connector

[]	Values included in square bracket must be considered for further studies, because it means that a
	decision about that value was not taken.
$\mathrm{BW}_{\mathrm{Channel}}$	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

 N_{oc} The power spectral density of a white noise source (average power per RE normalised to the

subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as

measured at the UE antenna connector

 N_{PRS} Number of consecutive downlink positioning subframes as defined in subclause 6.10.4.3 in 3GPP

TS 36.211

 n_{PRR} Physical Resource Block number as defined in subclause 3.1 in 3GPP TS 36.211.

 P_{CMAX} Configured UE transmitted power as defined in subclause 6.2.5 in 3GPP TS 36.101.

PRP Received (linear) average power of the resource elements that carry E-UTRA PRS, measured at

the UE antenna connector.

S Cell Selection Criterion 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

Srxlev Cell selection RX level, defined in TS 36.304, subclause 5.2.3.2 Squal Cell selection quality, defined in TS 36.304, subclause 5.2.3.2

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

 $T_{\rm PRS}$ Cell-specific positioning subframe configuration period as defined in subclause 6.10.4.3 in 3GPP

TS 36.211

 $T_{\text{RE-ESTABLISH-REQ}}$ The RRC Re-establishment delay requirement, the time between the moment when erroneous

CRCs are applied, to when the UE starts to send preambles on the PRACH.

 $\begin{array}{ll} {\rm Treselection} & {\rm Defined~in~TS~25.304,~subclause~5.2.6.1.5} \\ {\rm Treselection_{RAT}} & {\rm Defined~in~TS~36.304~,~subclause~5.2.4.7} \\ {\rm Treselection_{EUTRA}} & {\rm Defined~in~TS~36.304~,~subclause~5.2.4.7} \\ {\rm Treselection_{UTRA}} & {\rm Defined~in~TS~36.304~,~subclause~5.2.4.7} \\ {\rm Treselection_{GERA}} & {\rm Defined~in~TS~36.304~,~subclause~5.2.4.7} \\ \end{array}$

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 [x] 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 [x].

1x RTT CDMA2000 1x Radio Transmission Technology

ARQ Automatic Repeat Request
AWGN Additive White Gaussian Noise
BCCH Broadcast Control Channel
BCH Broadcast Channel

BCH Broadcast Channel CA Carrier Aggregation

CCCH SDU Common Control Channel SDU

CGI Cell Global Identifier CPICH Common Pilot Channel

CPICH Ec/No CPICH Received energy per chip divided by the power density in the band

C-RNTI Cell RNTI

DCCH Dedicated Control Channel

DL Downlink

DRX Discontinuous Reception
DTCH Dedicated Traffic Channel
DUT Device Under Test

E-CID Enhanced Cell-ID (positioning method)

ECGI Evolved CGI E-UTRAN NodeB eNB E-UTRA **Evolved UTRA** E-UTRAN **Evolved UTRAN**

FDD Frequency Division Duplex

GERAN GSM EDGE Radio Access Network **GSM** Global System for Mobile communication

HARQ Hybrid Automatic Repeat Request

НО Handover

HRPD High Rate Packet Data LPP LTE Positioning Protocol Medium Access Control MAC Minimization of Drive Tests **MDT** OFDMA Channel Noise Generator **OCNG**

OFDM Orthogonal Frequency Division Multiplexing **OFDMA** Orthogonal Frequency Division Multiple Access

OTDOA Observed Time Difference of Arrival

PBCH Physical Broadcast Channel

P-CCPCH Primary Common Control Physical Channel

PCel1 Primary Cell

PCFICH Physical Control Format Indicator CHannel **PDCCH** Physical Downlink Control CHannel **PDSCH** Physical Downlink Shared CHannel Physical Hybrid-ARQ Indicator CHannel PHICH

Public Land Mobile Network PLMN **PRACH** Physical Random Access CHannel **PRS** Positioning Reference Signal **PUCCH** Physical Uplink Control CHannel **PUSCH** Physical Uplink Shared Channel **RSCP** Received Signal Code Power **RSRP** Reference Signal Received Power Reference Signal Received Quality **RSRO** Received Signal Strength Indicator **RSSI RSTD** Reference Signal Time Difference OAM Quadrature Amplitude Modulation

RACH Random Access Channel **RAT** Radio Access Technology **RNC** Radio Network Controller

RNTI Radio Network Temporary Identifier

RRC Radio Resource Control **RRM** Radio Resource Management Synchronization Channel SCH

Secondary Cell **SCell** SDU Service Data Unit SFN System Frame Number SI System Information **SON** Self Optimized Network **TDD** Time Division Duplex Transmission Time Interval TTI

UE User Equipment

UL Uplink

UMTS Universal Mobile Telecommunication System

UTRA Universal Terrestrial Radio Access

UTRAN Universal Terrestrial Radio Access Network

3.4 Test tolerances

The requirements given in the present document make no allowance for measurement uncertainty. The test specification 36.521-3 [23] defines the test tolerances. These test tolerances are individually calculated for each test. The test

tolerances are then added to the limits in this specification to create test limits. The measurement results are compared against the test limits as defined by the shared risk principle.

Shared Risk is defined in [ETR 273 Part 1 sub-part 2 section 6.5].

4 E-UTRAN RRC_IDLE state mobility

4.1 Cell Selection

After a UE has switched on and a PLMN has been selected, the Cell selection process takes place, as described in TS36.304. 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*).

4.2 Cell Re-selection

4.2.1 Introduction

The cell reselection procedure allows the UE to select a more suitable cell and camp on it.

When the UE is in either *Camped Normally* state or *Camped on Any Cell* state on a cell, the UE shall attempt to detect, synchronise, and monitor intra-frequency, inter-frequency and inter-RAT cells indicated by the serving cell. For intra-frequency and inter-frequency cells the serving cell may not provide explicit neighbour list but carrier frequency information and bandwidth information only. UE measurement activity is also controlled by measurement rules defined in TS36.304, allowing the UE to limit its measurement activity.

4.2.2 Requirements

[Editor's Note: Requirements for multiple Tx antennas are still FFS. So far only 1Tx antenna case has been considered. The number of Tx antennas and possibly CP length may need to be provided per frequency layer. Details are FFS. Low mobility and high mobility requirements are still FFS]

The UE shall search every layer of higher priority at least every $T_{higher_priority_search} = (60 * N_{layers})$ seconds, where N_{layers} is the total number of configured higher priority E-UTRA, UTRA FDD, UTRA TDD, CDMA2000 1x and HRPD carrier frequencies and is additionally increased by one if one or more groups of GSM frequencies is configured as a higher priority.

4.2.2.1 Measurement and evaluation of serving cell

The UE shall measure the RSRP and RSRQ level of the serving cell and evaluate the cell selection criterion S defined in [1] for the serving cell at least every DRX cycle.

The UE shall filter the RSRP and RSRQ measurements of the serving 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 DRX cycle/2.

If the UE has evaluated in N_{serv} consecutive DRX cycles that the serving cell does not fulfil the cell selection criterion S, the UE shall initiate the measurements of all neighbour cells indicated by the serving cell, regardless of the measurement rules currently limiting UE measurement activities.

If the UE in RRC_IDLE has not found any new suitable cell based on searches and measurements using the intra-frequency, inter-frequency and inter-RAT information indicated in the system information for 10 s, the UE shall initiate cell selection procedures for the selected PLMN as defined in [1].

Table 4.2.2.1-1: N_{serv}

DRX cycle length [s]	N _{serv} [number of DRX cycles]
0.32	4
0.64	4
1.28	2
2.56	2

4.2.2.2 Void

4.2.2.3 Measurements of intra-frequency E-UTRAN cells

The UE shall be able to identify new intra-frequency cells and perform RSRP and RSRQ measurements 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 reselection criteria defined in TS36.304 within $T_{\text{detect}, \text{EUTRAN_Intra}}$ when that Treselection= 0. An intra frequency cell is considered to be detectable if:

- RSRP $|_{dBm} \ge$ -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and RSRP $\hat{E}s/Iot \ge$ -4 dB.
- RSRP $_{dBm} \ge -123$ dBm for Bands 9, 41 and RSRP \hat{E} s/Iot ≥ -4 dB,
- RSRP $|_{dBm} \ge -122 \text{ dBm for Bands } 2, 5, 7 \text{ and RSRP } \hat{E}s/Iot \ge -4 \text{ dB},$
- RSRP_{|dBm} \geq -121 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP £s/Iot \geq -4 dB,
- SCH_RP|_{dBm} \geq -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH $\hat{E}s/Iot \geq$ -4 dB,
- SCH_RP|_{dBm} \geq -123 dBm for Bands 9, 41 and SCH \hat{E} s/Iot \geq -4 dB,
- SCH_RP $|_{dBm} \ge -122 \text{ dBm}$ for Bands 2, 5, 7 and SCH Ês/Iot $\ge -4 \text{ dB}$,
- SCH_RP $|_{dBm}$ ≥ -121 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH Ês/Iot ≥ -4 dB.

The UE shall measure RSRP and RSRQ at least every $T_{measure,EUTRAN_Intra}$ (see table 4.2.2.3-1) for intra-frequency cells that are identified and measured according to the measurement rules.

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

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

For an intra-frequency 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 the intra-frequency cell has met reselection criterion defined [1] within $T_{\text{evaluate,E-UTRAN_intra}}$ when $T_{\text{reselection}} = 0$ as specified in table 4.2.2.3-1 provided that the cell is at least 3dB better ranked. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and non-serving intra-frequency cells.

If $T_{reselection}$ 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 $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

Table 4.2.2.3-1: T_{detect,EUTRAN_Intra}, T_{measure,EUTRAN_Intra} and T_{evaluate, E-UTRAN_intra}

DRX cycle length [s]	T _{detect,EUTRAN_Intra} [s] (number of DRX cycles)	T _{measure,EUTRAN_Intra} [s] (number of DRX cycles)	T _{evaluate,E-UTRAN_intra} [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7.68 (3)

4.2.2.4 Measurements of inter-frequency E-UTRAN cells

The UE shall be able to identify new inter-frequency cells and perform RSRP or RSRQ 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 $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$ then the UE shall search for inter-frequency layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in section 4.2.2.

If $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-frequency layers of higher, equal or lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority layers shall be the same as that defined below.

The UE shall be able to evaluate whether a newly detectable inter-frequency cell meets the reselection criteria defined in TS36.304 within $K_{carrier} * T_{detect,EUTRAN_Inter}$ if at least carrier frequency information is provided for inter-frequency neighbour cells by the serving cells when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute priorities or 4dB for RSRQ reselections based on absolute priorities.

The parameter $K_{carrier}$ is the number of E-UTRA inter-frequency carriers indicated by the serving cell. An inter-frequency cell is considered to be detectable if:

- RSRP_{|dBm} \geq -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and RSRP $\hat{E}s/Iot \geq -4$ dB,
- RSRP $_{dBm} \ge -123$ dBm for Bands 9, 41 and RSRP \hat{E} s/Iot ≥ -4 dB,
- RSRP $|_{dBm} \ge -122 \text{ dBm for Bands } 2, 5, 7 \text{ and RSRP } \hat{E}_{s}/\text{Iot} \ge -4 \text{ dB},$
- RSRP_{|dBm} \geq -121 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP £s/Iot \geq -4 dB,
- SCH_RP|_{dBm} \geq -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH $\hat{E}s/Iot \geq$ -4 dB,
- SCH_RP $|_{dBm} \ge -123$ dBm for Bands 9, 41 and SCH \hat{E} s/Iot ≥ -4 dB,
- SCH_RP $|_{dBm} \ge -122$ dBm for Bands 2, 5, 7 and SCH \hat{E} s/Iot ≥ -4 dB,
- SCH_RP |_{dBm}≥ -121 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH Ês/Iot ≥ -4 dB.

When higher priority cells are found by the higher priority search, they shall be measured at least every $T_{\text{measure},E-}$ $UTRAN_Inter$. 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. 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 or RSRQ at least every $K_{carrier} * T_{measure,EUTRAN_Inter}$ (see table 4.2.2.4-1) for identified lower or equal priority inter-frequency cells. 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 filter RSRP or RSRQ 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 a E-UTRA neighbour cell in cell reselection, 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 reselected to, the filtering shall be such that the UE shall be capable of evaluating that the inter-frequency cell has met reselection criterion defined TS 36.304 within $K_{carrier} * T_{evaluate,E-UTRAN_Inter}$ when $T_{reselection} = 0$ as specified in table 4.2.2.4-1 provided that the reselection criteria is met by a margin of at least 5dB for reselections based on ranking or 6dB for RSRP reselections based on absolute

priorities or 4dB for RSRQ reselections based on absolute priorities. When evaluating cells for reselection, the side conditions for RSRP and SCH apply to both serving and inter-frequency cells.

If $T_{reselection}$ 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 $T_{reselection}$ time. If this cell remains better ranked within this duration, then the UE shall reselect that cell.

DRX cycle length [s]	T _{detect,EUTRAN_Inter} [s] (number of DRX cycles)	T _{measure,EUTRAN_Inter} [s] (number of DRX cycles)	T _{evaluate,E} . UTRAN_Inter [s] (number of DRX cycles)
0.32	11.52 (36)	1.28 (4)	5.12 (16)
0.64	17.92 (28)	1.28 (2)	5.12 (8)
1.28	32(25)	1.28 (1)	6.4 (5)
2.56	58.88 (23)	2.56 (1)	7 68 (3)

Table 4.2.2.4-1: T_{detect,EUTRAN_Inter}, T_{measure,EUTRAN_Inter} and T_{evaluate,E-UTRAN_Inter}

4.2.2.5 Measurements of inter-RAT cells

If $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$ then the UE shall search for inter-RAT layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is described in section 4.2.2

If $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ then the UE shall search for and measure inter-RAT layers of higher, lower priority in preparation for possible reselection. In this scenario, the minimum rate at which the UE is required to search for and measure higher priority inter-RAT layers shall be the same as that defined below for lower priority RATs.

4.2.2.5.1 Measurements of UTRAN FDD cells

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

The UE shall evaluate whether newly detectable UTRA FDD cells have met the reselection criteria in TS 36.304 within time ($N_{UTRA_carrier}$) * $T_{detectUTRA_FDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchQ}$ when $Treselection_{RAT} = 0$ provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io.

Cells which have been detected shall be measured at least every ($N_{UTRA_carrier}$) * $T_{measureUTRA_FDD}$ when $Srxlev \leq S_{nonIntraSearchP}$ or $Squal \leq S_{nonIntraSearchP}$.

When higher priority UTRA FDD cells are found by the higher priority search, they shall be measured at least every $T_{measure,UTRA_FDD}$. 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 FDD cell has met reselection criterion defined in 3GPP TS 36.304 [1] within $(N_{UTRA_carrier}) * T_{evaluateUTRA_FDD}$ when $T_{reselection} = 0$ as specified in table 4.2.2.5.1-1 provided that the reselection criteria is met by a margin of at least 6dB for reselections based on RSCP, or a margin of at least 3dB for reselections based on Ec/Io.

If $T_{reselection}$ timer has a non zero value and the UTRA FDD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this UTRA FDD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

DRX T_{detectUTRA_FDD} T_{measureUTRA_FDD} TevaluateUTRA_FDD [s] (number of (number cycle of [s] DRX cycles) DRX cycles) length [s] 0.32 5.12 (16) 15.36 (48) 0.64 30 5.12 (8) 15.36 (24) 1.28 6.4(5) 19.2 (15) 60 7.68 (3) 23.04 (9) 2.56

Table 4.2.2.5.1-1: T_{detectUTRA FDD}, T_{measureUTRA FDD}, and T_{evaluateUTRA FDD}

4.2.2.5.2 Measurements of UTRAN TDD cells

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

The UE shall evaluate whether newly detectable UTRA TDD cells have met the reselection criteria in TS 36.304 within time $(N_{UTRA_carrier_TDD}) * T_{detectUTRA_TDD}$ when $Srxlev \le S_{nonIntraSearchP}$ or $Squal \le S_{nonIntraSearchP}$ when $T_{reselection} = 0$ provided that the reselection criteria is met by a margin of at least 6dB.

Cells which have been detected shall be measured at least every $(N_{UTRA_carrier_TDD}) * T_{measureUTRA_TDD}$ Srxlev $\leq S_{nonIntraSearchP}$ or Squal $\leq S_{nonIntraSearchP}$.

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 [1] within $N_{UTRA_carrier_TDD}$ * $T_{evaluateUTRA_TDD}$ when $T_{reselection} = 0$ as specified in table 4.2.2.5.2-1 provided that the reselection criteria is met by a margin of at least 6dB.

If $T_{reselection}$ timer has a non zero value and the UTRA TDD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this UTRA TDD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

Table 4.2.2.5.2-1: $T_{detectUTRA_TDD}$, $T_{measureUTRA_TDD}$ and $T_{evaluateUTRA_TDD}$

DRX cycle length [s]	T _{detectUTRA_TDD}	T _{measureUTRA_TDD} [s] (number of DRX cycles)	T _{evaluateUTRA_TDD} [s] (number DRX cycles)	of
0.32		5.12 (16)	15.36 (48)	
0.64	30	5.12 (8)	15.36 (24)	
1.28		6.4(5)	19.2 (15)	•
2.56	60	7.68 (3)	23.04 (9)	

4.2.2.5.3 Measurements of GSM cells

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

When higher priority GSM BCCH carriers are found by the higher priority search, they shall be measured at least every $T_{\text{measure,GSM}}$, 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 reselection has not occurred then the UE is not required to continuously measure the detected cell to evaluate the ongoing possibility of reselection, or to continuously verify the BSIC of the GSM BCCH carrier every 30s. 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.

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 [1], 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 reselection, if the UE cannot demodulate the BSIC of that GSM BCCH carrier. Additionally, the UE shall not consider a GSM neighbour cell in cell reselection, if it is indicated as not allowed in the measurement control system information of the serving cell.

If $T_{reselection}$ timer has a non zero value and the GSM cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this GSM cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

DRX cycle length	T _{measure,GSM} [s] (number of DRX	
[s]	cycles)	
0.32	5.12 (16)	
0.64	5.12 (8)	
1.28	6.4(5)	
2.56	7.68 (3)	

Table 4.2.2.5.3-1: T_{measure,GSM},

4.2.2.5.4 Measurements of HRPD cells

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 E-UTRA serving cell fulfils $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$, the UE shall search for CDMA2000 HRPD layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is defined in section 4.2.2.

For CDMA2000 HRPD cells which have been detected, the UE shall measure CDMA2000 HRPD Pilot Strength at least every (Number of HRPD Neighbor Frequency)* $T_{measureHRPD}$, when the E-UTRA serving cell Srxlev $\leq S_{nonIntraSearchP}$ or Squal $\leq S_{nonIntraSearchQ}$.

The UE shall be capable of evaluating that the CDMA2000 HRPD cell has met cell reselection criterion defined in [1] within $T_{\text{evaluateHRPD}}$.

Table 4.2.2.5.4-1 gives values of T_{measureHRPD} and T_{evaluateHRPD}.

Table 4.2.2.5.4-1: T_{measureHRPD} and T_{evaluateHRPD}

DRX cycle length [s]	T _{measureHRPD} [s] (number of DRX cycles)	T _{evaluateHRPD} [s] (number of DRX cycles)
0.32	5.12 (16)	15.36 (48)
0.64	5.12 (8)	15.36 (24)
1.28	6.4 (5)	19.2 (15)
2.56	7.68 (3)	23.04 (9)

If $T_{reselection}$ timer has a non zero value and the CDMA2000 HRPD cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this CDMA2000 HRPD cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

4.2.2.5.5 Measurements of cdma2000 1X

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 E-UTRA serving cell fulfils $Srxlev > S_{nonIntraSearchP}$ and $Squal > S_{nonIntraSearchQ}$, the UE shall search for cdma2000 1X layers of higher priority at least every $T_{higher_priority_search}$ where $T_{higher_priority_search}$ is defined in section 4.2.2.

For CDMA2000 1X cells which have been detected, the UE shall measure CDMA2000 1xRTT Pilot Strength at least every (Number of CDMA2000 1X Neighbor Frequency)* $T_{measureCDMA2000_1X}$, when the E-UTRA serving cell Srxlev $\leq S_{nonIntraSearchP}$ or Squal $\leq S_{nonIntraSearchQ}$. The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in [1] within $T_{evaluateCDMA2000_1X}$.

Table 4.2.2.5.5-1 gives values of T_{measureCDMA2000 1X} and T_{evaluateCDMA2000 1X}.

Table 4.2.2.5.5-1: T_{measureCDMA2000 1X and} T_{evaluateCDMA2000 1X}

DRX cycle length [s]	T _{measureCDMA2000_1X} [s] (number of DRX cycles)	T _{evaluateCDMA2000_1X} [s] (number of DRX cycles)
0.32	5.12 (16)	15.36 (48)
0.64	5.12 (8)	15.36 (24)
1.28	6.4 (5)	19.2 (15)
2.56	7.68 (3)	23.04 (9)

If $T_{reselection}$ timer has a non zero value and the CDMA2000 1X cell is satisfied with the reselection criteria which are defined in [1], the UE shall evaluate this CDMA2000 1X cell for the $T_{reselection}$ time. If this cell remains satisfied with the reselection criteria within this duration, then the UE shall reselect that cell.

4.2.2.6 Evaluation of cell re-selection criteria

The UE shall evaluate the intra-frequency, inter-frequency and inter-RAT cell reselection criteria defined in [1] at least every DRX cycle. When a non zero value of $T_{reselection}$ is used, the UE shall only perform reselection on an evaluation which occurs simultaneously to, or later than the expiry of the $T_{reselection}$ timer.

4.2.2.7 Maximum interruption in paging reception

UE shall perform the cell re-selection with minimum interruption in monitoring downlink channels for paging reception.

At intra-frequency and 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 intra-frequency and inter-frequency cell for paging reception. The interruption time shall not exceed $T_{SLEUTRA} + 50$ ms.

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-RAT cell. For E-UTRAN to UTRA cell re-selection the interruption time must not exceed $T_{SI\text{-}UTRA} + 50$ ms. For E-UTRAN to GSM cell reselection the interruption time must not exceed $T_{BCCH} + 50$ 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 defined in [2] for a E-UTRAN cell.

T_{SI-UTRA} 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 defined in [7] for a UTRAN cell.

T_{BCCH} is the maximum time allowed to read BCCH data from a GSM cell defined in [8].

These requirements assume sufficient radio conditions, so that decoding of system information can be made without errors and does not take into account cell re-selection failure.

At cell re-selection to HRPD, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable of starting to monitor downlink channels for paging reception of the target HRPD cell. For HRPD cell reselection the interruption time must not exceed $T_{SI-HRPD} + 50$ ms.

 $T_{SI\text{-HRPD}}$ is the time required for receiving all the relevant system information data according to the reception procedure and the upper layer (Layer 3) procedure delay of system information blocks defined in [11] in for HRPD cell.

At cell re-selection to cdma2000 1X, the UE shall monitor the downlink of serving cell for paging reception until the UE is capable of starting to monitor downlink channels for paging reception of the target cdma2000 1X cell. For cdma2000 1X cell re-selection the interruption time must not exceed $T_{SI\text{-}cdma2000\ IX} + 50$ ms.

 $T_{SI\text{-}cdma2000_1X}$ is the time required for receiving all the relevant system information data according to the reception procedure and the upper layer (Layer 3) procedure delay of system information blocks defined in [15] for cdma2000 1X cell.

4.2.2.8 void

4.2.2.9 UE measurement capability

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

- Intra-frequency carrier, and
- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 3 TDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 3 FDD UTRA carriers, and
- Depending on UE capability, 3 TDD UTRA carriers, and
- Depending on UE capability, 32 GSM carriers, and
- Depending on UE capability, 3 cdma2000 1x carriers, and
- Depending on UE capability, 3 HRPD carriers.

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

4.2.2.10 Reselection to CSG cells

Note:

Requirements in this section are minimum requirements defined to ensure the testability of autonomous CSG search. Further information on autonomous search times in practical deployments is available in [25].

Reselection from non CSG to CSG cells may be performed using UE autonomous search as defined in [1] when at least one CSG ID is included in the UE's CSG whitelist. The requirements in this section are valid for reselection to CSG cells previously visited by the UE when the radio configuration parameters, including the carrier frequency and physical cell identity of the CSG cell, non CSG cell and other neighbour cells are unchanged from the most recent previous visit.

NOTE: According to [1], the UE autonomous search function, per UE implementation, determines when and/or where to search for allowed CSG cells.

4.2.2.10.1 Reselection from a non CSG to an inter-frequency CSG cell

The UE shall perform search and reselection to an allowed inter-frequency CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 4.2.2.10.1-1. There is no need for statistical testing of this requirement.

Table 4.2.2.10.1-1: Parameters for CSG inter-frequency reselection

Parameter	Unit	Cell 1	Cell 2
E-UARFCN Note1		Channel 1	Channel 2
CSG indicator		False	True
Physical cell identity ^{Note1}		1	2
CSG identity		Not sent	Sent
			(Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non	
CSG cell previously		Ye	S
visited by UE			T
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	0	
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		
Qrxlevmin	dBm	-140	-140
N_{oc} dBm/15 kHz Off			
RSRP Note2	dBm/15 KHz	[≥TBD]	[≥TBD]
Note 1: For this requirement to be applicable, the E-UARFCN and physical cell identity for cell 1 and cell 2 shall be unchanged from when the CSG cell			

was visited previously

Note 2: Chosen to ensure that CSG autonomous search has a high probability of success on every attempt made by UE

4.2.2.10.2 Reselection from a non CSG to an inter-RAT UTRAN FDD CSG cell

The UE shall perform search and reselection to an allowed inter-RAT UTRAN FDD CSG cell that has met CSG reselection criterion defined in [1] and that is in its whitelist, within 6 minutes in the conditions shown in table 4.2.2.10.2-1. There is no need for statistical testing of this requirement.

Table 4.2.2.10.2-1: Parameters for CSG inter-RAT UTRAN FDD reselection

Parameter	Unit	Cell 1	Cell 2
E-UARFCN Note1	U	Channel 1	N/A
UARFCN Note1		N/A	Channel 2
CSG indicator		False	True
Physical cell identity ^{Note1}		1	N/A
Primary scrambling code		N/A	Scrambling
Note1			code 2
CSG identity		Not sent	Sent
			(Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non multipath	
CSG cell previously		Yes	
visited by UE			T
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB	0	
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		N/A
PHICH_RB	dB		IN/A
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	Off	
RSRP Note2	dBm/15 KHz	[≥TBD]	
CPICH_Ec ^{Note2}	dBm	[]	[≥TBD]
CPICH_Ec/lor	dB		-10
PCCPCH_Ec/lor	dB	N/A	-12
SCCPCH_Ec/lor	dB		-12
AICH Ec/lor	dB		-15
SCH Ec/lor	dB		-15
PICH_Ec/lor	dB		-15
I_{oc}	dBm/3.84 MHz		Off
Note 1: For this requirement to be applicable, the E-UARFCN and physical cell			
identity for cell 1 and the UARFCN and scrambling code for cell 2 shall			

Note 1: For this requirement to be applicable, the E-UARFCN and physical cell identity for cell 1 and the UARFCN and scrambling code for cell 2 shall be unchanged from when the CSG cell was visited previously

Note 2: Chosen to ensure that CSG autonomous search has a high probability of success on every attempt made by UE

4.3 Minimization of Drive Tests (MDT)

UE supporting minimisation of drive tests shall be capable of logging idle mode measurements and reporting the logged measurements as specified in [27]. The requirements for logged measurements are given in the following sections.

4.3.1 Introduction

The MDT requirements consist of measurement requirements as specified in section 4.3.2 and relative time stamp accuracy requirements as specified in section 4.3.3. Both sets of requirements are applicable for intra-frequency, interfrequency and inter-RAT cases in RRC_IDLE state. The MDT procedures are described in [27].

4.3.2 Measurements

The measurements (GSM carrier RSSI, UTRA CPICH RSCP, UTRA CPICH Ec/Io, P-CCPCH RSCP for UTRA 1.28 TDD, E-UTRA RSRP and E-UTRA RSRQ) used by the UE for the logged MDT in RRC_IDLE shall be the same as specified for the serving cell measurement and evaluation in section 4.2.2.1, for the measurements of intra-frequency E-UTRAN cells in section 4.2.2.3, for the measurements of inter-frequency E-UTRAN cells in section 4.2.2.4 and for the measurements of inter-RAT cells in section 4.2.2.5.

4.3.2.1 Requirements

The measurement values that are used to meet serving cell and reselection requirements as specified in sections 4.2.2.1, 4.2.2.3, 4.2.2.4, 4.2.2.5 shall also apply to values logged for MDT measurements in RRC_IDLE state.

4.3.3 Relative Time Stamp Accuracy

The relative time stamp for a logged measurement is defined as the time from the moment the MDT configuration was received at the UE until the measurement was logged, see [2].

4.3.3.1 Requirements

The accuracy of the relative time stamping is such that the drift of the time stamping shall be not more than \pm [TBD] seconds per hour.

5 E-UTRAN RRC_CONNECTED state mobility

Note: For the performance requirements specified hereafter, the state when no DRX is used is defined as follows:

- DRX parameters are not configured; or
- DRX parameters are configured and
 - o *drx-InactivityTimer* is running; or
 - o drx-RetransmissionTimer is running; or
 - o mac-ContentionResolutionTimer is running; or
 - o a Scheduling Request sent on PUCCH is pending; or
 - o an uplink grant for a pending HARQ retransmission can occur and there is data in the corresponding HARQ buffer; or
 - a PDCCH indicating a new transmission addressed to the C-RNTI of the UE has not been received after successful reception of a Random Access Response for the explicitly signaled preamble (only applicable to UEs in RRC CONNECTED).

Otherwise

- It is the state when DRX is used.

5.1 E-UTRAN Handover

5.1.1 Introduction

5.1.2 Requirements

5.1.2.1 E-UTRAN FDD – FDD

The requirements in this section are applicable to both intra-frequency and inter-frequency handovers.

5.1.2.1.1 Handover delay

Procedure delays for all procedures that can command a handover are specified in [2].

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

Where:

 $D_{handover}$ equals the maximum RRC procedure delay to be defined in section 11.2 in 3GPP TS 36.331 [2] plus the interruption time stated in section 5.1.2.1.2.

5.1.2.1.2 Interruption time

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 or inter-frequency handover is commanded, the interruption time shall be less than Tinterrupt

$$T_{interrupt} \equiv T_{search} + T_{IU} + 20 \ ms$$

Where:

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

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

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

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in Section 8.1.2.2.1 for intra-frequency handover and Section 8.1.2.3.1 for inter-frequency handover.

5.2.2.2 E-UTRAN FDD – TDD

The requirements in this section are applicable to handover from FDD to TDD. The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 5.2.2.4 apply for this section.

5.2.2.2.1 (Void)

5.2.2.2 (Void)

5.2.2.3 E-UTRAN TDD – FDD

The requirements in this section are applicable to handover from TDD to FDD. The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 5.1.2.1 apply for this section.

5.2.2.3.1 (Void)

5.2.2.3.2 (Void)

5.2.2.4 E-UTRAN TDD – TDD

The requirements in this section are applicable to both intra-frequency and inter-frequency handovers.

5.2.2.4.1 Handover delay

Procedure delays for all procedures that can command a handover are specified in 3GPP TS 36.331 [2].

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

Where:

 $D_{handover}$ equals the maximum RRC procedure delay to be defined in section 11.2 in 3GPP TS36.331 [2] plus the interruption time stated in section 5. 2.2.4.2.

5.2.2.4.2 Interruption time

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 or inter-frequency handover is commanded, the interruption time shall be less than Tinterrupt

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

Where

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

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

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

In the interruption requirement a cell is known if it has been meeting the relevant cell identification requirement during the last 5 seconds otherwise it is unknown. Relevant cell identification requirements are described in Section 8.1.2.2.2 for intra-frequency handover and Section 8.1.2.3.4 for inter-frequency handover.

5.3 Handover to other RATs

5.3.1 E-UTRAN - UTRAN FDD Handover

5.3.1.1 Introduction

The purpose of inter-RAT handover from E-UTRAN to UTRAN FDD is to change the radio access mode from E-UTRAN to UTRAN FDD. The handover procedure is initiated from E-UTRAN with a RRC message that implies a hard handover as described in [2].

5.3.1.1.1 Handover delay

When the UE receives a RRC message implying handover to UTRAN the UE shall be ready to start the transmission of the new UTRA uplink DPCCH within $D_{handover}$ seconds from the end of the last E-UTRAN TTI containing the RRC MOBILITY FROM E-UTRA command.

where:

- D_{handover} equals the RRC procedure delay, which is 50 ms plus the interruption time stated in section 5.3.1.1.2.

5.3.1.1.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCCH in UTRAN FDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The target cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell is known the interruption time shall be less than $T_{interrupt1}$

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

If the target cell is unknown the interruption time shall be less than Tinterrupt2

$$T_{interrupt2} = T_{IU} + T_{sync} + 150 + 10*F_{max} ms$$

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. Performance requirements for E-UTRA to UTRA soft handover are not specified. 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 3GPP TS 25.214 section 4.3.1.2 [20]. In case higher layers indicate the usage of a post-verification period T_{sync} =0 ms. Otherwise T_{sync} =40 ms.

3

The phase reference is the primary CPICH.

The requirements in this section assume that N312 has the smallest possible value i.e. only one insync is required.

5.3.2 E-UTRAN - UTRAN TDD Handover

5.3.2.1 Introduction

The purpose of inter-RAT handover from E-UTRAN to UTRAN TDD is to change the radio access mode from E-UTRAN to UTRAN TDD. The handover procedure is initiated from E-UTRAN with a RRC message that implies a hard handover as described in [2].

5.3.2.2 Requirements

The requirements in this section shall apply to UE supporting E-UTRAN and UTRAN TDD.

5.3.2.2.1 Handover delay

When the UE receives a RRC message implying E-UTRAN/UTRAN TDD handover the UE shall be ready to start the transmission of the new uplink DPCH or the SYNC-UL within $D_{handover}$ seconds from the end of the last TTI containing the RRC MOBILITY FROM E-UTRA command.

Where:

- D_{handover} equals the RRC procedure delay, which is 50 ms plus the interruption time stated in section 5.3.2.2.

5.3.2.2.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink DPCH or the SYNC-UL in UTRAN TDD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

The UE shall always perform a UTRA synchronisation procedure as part of the handover procedure.

If the target cell has been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt1}$

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

If the target cell has not been measured by the UE during the last 5 seconds, the interruption time shall be less than $T_{interrupt2}$

$$T_{interrupt2} = T_{offset} + T_{UL} + 30*F_{SFN} + 180 + 10*F_{max} ms$$

Where:

 T_{offset} Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel T_{UL} Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell 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

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.

transport channels that are multiplexed into the same CCTrCH.

5.3.3 E-UTRAN - GSM Handover

5.3.3.1 Introduction

The purpose of inter-RAT handover from E-UTRAN to GSM is to transfer a connection between the UE and E-UTRAN to GSM. The handover procedure is initiated from E-UTRAN with a RRC message (MOBILITY FROM E-UTRA). The procedure is described in in 3GPP TS 36.331 [2].

5.3.3.2 Requirements

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

The requirements given below in Tables 5.3.3.2.1-1 and 5.3.3.2.2-1 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 [2].

5.3.3.2.1 Handover delay

When the UE receives a RRC MOBILITY FROM E-UTRA command the UE shall be ready to transmit (as specified in [10]) on the channel of the new RAT within the value in table 5.3.3.2.1-1 from the end of the last TTI containing the RRC command. The UE shall process the RRC procedures for the MOBILITY FROM E-UTRA command within 50 ms, which is noted as RRC procedure delay.

Table 5.3.3.2.1-1: E-UTRAN/GSM handover - handover delay

UE synchronisation status	handover delay [ms]
The UE has synchronised to the GSM cell before the	90
RRC MOBILITY FROM E-UTRA COMMAND is received	
The UE has not synchronised to the GSM cell before	190
the RRC MOBILITY FROM E-UTRA COMMAND is	
received	

5.3.3.2.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission on the uplink channel in GSM, excluding the RRC procedure delay. The interruption time depends on whether the UE has synchronized to the target GSM cell or not and shall be less than the value specified in table 5.3.3.2.2-1.

Table 5.3.3.2.2-1: E-UTRAN/GSM handover - interruption time

Synchronisation status	Interruption time [ms]
The UE has synchronised to the GSM cell before the	40
RRC MOBILITY FROM E-UTRA COMMAND is received	
The UE has not synchronised to the GSM cell before	140
the RRC MOBILITY FROM E-UTRA COMMAND is	
received	

5.4 Handover to Non-3GPP RATs

5.4.1 E-UTRAN – HRPD Handover

5.4.1.1 Introduction

The handover procedure from E-UTRAN to HRPD is initiated when E-UTRAN sends handover command to the UE through dedicated RRC signalling.

5.4.1.1.1 Handover delay

The handover delay (D_{handover}) is defined as the sum of the RRC procedure delay, which is 50 ms and the interruption time specified in section 5.4.1.1.2.

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.

5.4.1.1.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in HRPD, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

An HRPD cell is known if it has been measured by the UE during the last 5 seconds otherwise it is unknown. Under the reference conditions specified in sub-clause 6.6 of [13], the interruption time shall be less than T_{interrupt}

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O ms$$

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 [11], which is specific to HRPD.

5.4.2 E-UTRAN – cdma2000 1X Handover

5.4.2.1 Introduction

The handover procedure from E-UTRAN to cdma2000 1X is initiated when E-UTRAN sends handover command to the UE through dedicated RRC signalling.

5.4.2.1.1 Handover delay

The handover delay ($D_{handover}$) is defined as the sum of the RRC procedure delay, which is 130 ms and the interruption time specified in section 5.4.2.1.2.

When the UE receives a RRC message implying handover to cdma2000 1X, the UE shall be ready to start the transmission of the new reverse control channel in cdma2000 1X within $D_{handover}$ from the end of the last E-UTRAN TTI containing the RRC command.

5.4.2.1.2 Interruption time

The interruption time is the time between the end of the last TTI containing the RRC command on the E-UTRAN PDSCH and the time the UE starts transmission of the reverse control channel in cdma2000 1X, excluding the RRC procedure delay. The interruption time depends on whether the target cell is known to the UE or not.

A cdma2000 1X 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 [14], the interruption time shall be less than T_{interrupt}:

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_K + 10*OC*SW_O ms$$

Where:

 $T_{\rm IU}$ It is the interruption uncertainty when changing the timing from the E-UTRAN to the new cdma2000 1X cell. $T_{\rm IU}$ can be up to one cdma2000 1X frame (20 ms).

SW_K is SW_K = $\left[\frac{\text{srch_win_k}}{60}\right]$ where srch_win_k is the number of cdma2000 1x chips indicated by

the search window for known target cdma2000 1x cells in the message

SW_O is SW_O = $\left[\frac{\text{srch_win_o}}{60}\right]$ where srch_win_o is the number of cdma2000 1x chips indicated by

the search window for unknown target cdma2000 1x cells in the message

KC It is the number of known target cdma2000 1X cells in the message, and

OC It is the number of unknown target cdma2000 1X cells in the message.

6 RRC Connection Mobility Control

6.1 RRC Re-establishment

The requirements in this section are applicable to both E-UTRAN FDD and TDD.

6.1.1 Introduction

RRC connection re-establishment is initiated when a UE in RRC connected mode looses RRC connection due to any of these reasons: radio link failure, handover failure or radio link problem. The RRC es-tablishment procedure is specified in section 5.3.7 in TS 36.331 [2].

6.1.2 Requirements

In RRC connected mode the UE shall be capable of sending RRCConnectionReestablishmentRequest message within $T_{re\text{-establish_delay}}$ seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ($T_{re\text{-establish_delay}}$) shall be less than:

$$T_{re\text{-establish_delay}} = T_{UL_grant} + T_{UE_re\text{-establish_delay}}$$

 T_{UL_grant} : It is the time required to acquire and process uplink grant from the target cell. The uplink grant is required to transmit RRCConnectionReestablishmentRequest message.

The UE re-establishment delay (T_{UE_re-establish_delay}) is specified in section 6.1.2.1.

6.1.2.1 UE Re-establishment delay requirement

The UE re-establishment delay ($T_{UE_re-establish_delay}$) is the time between the moments when any of the conditions requiring RRC re-establishment as defined in section 5.3.7 in TS 36.331 [2] is detected by the UE to the time when the UE sends PRACH to the target cell. The UE re-establishment delay ($T_{UE_re-establish_delay}$) requirement shall be less than:

$$T_{\text{UE-re-establish_delay}} = 50 \text{ ms} + N_{\text{freq}} * T search + T_{\text{SI}} + T_{PRACH}$$

T_{search}: It is the time required by the UE to search the target cell.

 $T_{\text{search}} = \text{It is [100]}$ ms if the target cell is known by the UE; the target cell is known if it has been measured by the UE in the last 5 seconds.

 $T_{\text{search}} = \text{It is } 800 \text{ ms}$ if the target cell is unknown by the UE; the target cell is unknown if it has not been measured by the UE in the last 5 seconds.

 T_{SI} = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [2] for E-UTRAN cell.

T_{PRACH} = The additional delay caused by the random access procedure; it will be at least 10 ms due to random access occasion and there might be additional delay due to ramping procedure.

 N_{freq} : It is the total number of E-UTRA frequencies to be monitored for RRC re-establishment; $N_{\text{freq}} = 1$ if the target cell is known.

There is no requirement if the target cell does not contain the UE context.

6.2 Random Access

6.2.1 Introduction

The random access procedure is used when establishing the layer 1 communication between the UE and E-UTRAN. The random access is specified in section 6 of TS 36.213[3] and the control of the RACH transmission is specified in section 5.1 of TS 36.321[17].

6.2.2 Requirements

The UE shall have capability to calculate PRACH transmission power according to the PRACH power formula defined in TS 36.213[3] and apply this power level at the first preamble or additional preambles. The absolute power applied to the first preamble shall have an accuracy as specified in table 6.3.5.1.1-1 of TS 36.101[5]. The relative power applied to additional preambles shall have an accuracy as specified in table 6.3.5.2.1-1 of 36.101[5].

The UE shall indicate a Random Access problem to upper layers if the maximum number of preamble transmission counter has been reached.

6.2.2.1 Contention based random access

6.2.2.1.1 Correct behaviour when receiving Random Access Response reception

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.

6.2.2.1.2 Correct behaviour when not receiving Random Access Response reception

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 RA Response window defined in clause 5.1.4 TS 36.321.

6.2.2.1.3 Correct behaviour when receiving a NACK on msg3

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3.

6.2.2.1.4 Void

6.2.2.1.5 Correct behaviour when receiving a message over Temporary C-RNTI

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 transmitted in the uplink message.

6.2.2.1.6 Correct behaviour when contention Resolution timer expires

The UE shall re-select a preamble and transmit with the calculated PRACH transmission power when the backoff time expires if the Contention Resolution Timer expires.

6.2.2.2 Non-Contention based random access

6.2.2.2.1 Correct behaviour when receiving Random Access Response

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.

6.2.2.2.2 Correct behaviour when not receiving Random Access Response

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

7 Timing and signalling characteristics

7.1 UE transmit timing

7.1.1 Introduction

The UE shall have capability to follow the frame timing change of the connected eNode B. 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 UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are defined in the following requirements.

7.1.2 Requirements

The UE initial transmission timing error shall be less than or equal to $\pm T_e$ where the timing error limit value T_e is specified in Table 7.1.2-1. This requirement applies when it is the first transmission in a DRX cycle for PUCCH, PUSCH and SRS or it is the PRACH transmission. The reference point for the UE initial transmit timing control requirement shall be the downlink timing minus $(N_{TA_Ref} + N_{TA_offset}) \times T_s$. The downlink timing is defined as the time when [the first detected path (in time)] of the corresponding downlink frame is received from the reference cell. N_{TA_Ref} for PRACH is defined as 0. $(N_{TA_Ref} + N_{TA_offset})$ (in T_s units) for other channels is the difference between UE transmission timing and the Downlink timing immediately after when the last timing advance in section 7.3 was applied. N_{TA_Ref} for other channels is not changed until next timing advance is received.

Table 7.1.2-1: Te Timing Error Limit

Downlink Bandwidth (MHz)	T _{e_}
1.4	24*T _S
≥3	12*T _S
Note: T _S is the basic timing unit defined in TS 36.211	

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 section 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 $(N_{TA_Ref} + N_{TA_offset}) \times T_s$ before the downlink timing. All adjustments made to the UE uplink timing shall follow these rules:

- 1) The maximum amount of the magnitude of the timing change in one adjustment shall be $T_{\rm q}$ seconds.
- 2) The minimum aggregate adjustment rate shall be $7*T_S$ per second.
- 3) The maximum aggregate adjustment rate shall be T_q per 200ms.

where the maximum autonomous time adjustment step T_q is specified in Table 7.1.2-2.

Table 7.1.2-2: T_q Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T _{q_}
1.4	16*T _S
3	8*T _S
5	4*T _S
≥10	2*T _S
Note: T _S is the basic timing unit defined in TS 36.211	

7.2 UE timer accuracy

7.2.1 Introduction

UE timers are used in different protocol entities to control the UE behaviour.

7.2.2 Requirements

For UE timers specified in [2], UE shall comply with the timer accuracies according to Table 7.2.2-1.

The requirements are only related to the actual timing measurements internally in the UE. They do not include the following:

- Inaccuracy in the start and stop conditions of a timer (e.g. UE reaction time to detect that start and stop conditions of a timer is fulfilled), or
- Inaccuracies due to restrictions in observability of start and stop conditions of a UE timer (e.g. TTI alignment when UE sends messages at timer expiry).

Table 7.2.2-1

Timer value [s]	Accuracy
timer value < 4	± 0.1s
timer value ≥ 4	± 2.5%

7.3 Timing Advance

7.3.1 Introduction

The timing advance is initiated from E-UTRAN with MAC message that implies and adjustment of the timing advance, see 3GPP TS 36.321 [17] section 5.2.

7.3.2 Requirements

7.3.2.1 Timing Advance adjustment delay

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.

7.3.2.2 Timing Advance adjustment accuracy

The UE shall adjust the timing of its transmissions with a relative accuracy better than or equal to $\pm 4*$ T_S seconds to the signalled timing advance value compared to the timing of preceding uplink transmission. The timing advance command is expressed in multiples of 16* T_S and is relative to the current uplink timing.

7.4 Cell phase synchronization accuracy (TDD)

7.4.1 Definition

Cell phase synchronization accuracy is defined as the maximum absolute deviation in frame start timing between any pair of cells on the same frequency that have overlapping coverage areas.

7.4.2 Minimum requirements

For Wide Area BS, the cell phase synchronization accuracy measured at BS antenna connectors shall be better than the requirement specified in table 7.4.2-1. If a cell's coverage area overlaps with another cell with different cell radius then the cell phase synchronization accuracy corresponding to the larger of the two cell sizes applies to the overlapping cells with different radii.

Table 7.4.2-1 Cell phase synchronization requirement for wide area BS (TDD)

Cell Type	Cell Radius	Requirement
Small cell	≤ 3 km	≤ 3 μs
Large cell	> 3 km	≤ 10 us

For Home BS, the cell phase synchronization accuracy measured at BS antenna connectors shall be better than the requirement specified in table 7.4.2-2.

Table 7.4.2-2 Cell phase synchronization requirement for Home BS (TDD)

Source Cell Type	Propagation Distance	Requirement
Small cell	≤ 500 m	≤ 3 μs
Large cell	> 500 m	≤1.33 + T _{propagation} μs

Note 1: $T_{propagation}$ is the propagation delay between the Home BS and the cell selected as the network listening synchronization source. In terms of the network listening synchronization source selection, the best accurate synchronization source to GNSS should be selected.

Note 2: If the Home BS obtains synchronization without using network listening, the small cell requirement applies.

7.5 Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers

7.5.1 Introduction

This section contains the synchronization requirements for eNodeB capable of supporting E-UTRAN to CDMA 1xRTT and HRPD handovers. To facilitate E-UTRAN to CDMA 1xRTT and HRPD handovers, the CDMA System Time reference needs to be provided to the UE in order for the UE to report the pilot PN phases of the target 1xRTT or HRPD cells. This is achieved through the SIB8 message broadcasted by the serving eNodeB:

If the eNodeB is synchronized to the GPS time then the size of CDMA System Time information is 39 bits and the unit is 10 ms based on a 1.2288 Mcps chip rate.

If the eNodeB is not synchronized to the GPS time then the size of CDMA System Time information is 49 bits and the unit is 8 CDMA chips based on 1.2288 Mcps chip rate.

The CDMA system time reference provided by the serving eNodeB has to be within a certain level of accuracy in order to facilitate accurate reporting of the pilot PN phases of the target 1xRTT or HRPD cells and enable reliable handover to the 1xRTT or HRPD networks.

7.5.2 eNodeB Synchronization Requirements

7.5.2.1 Synchronized E-UTRAN

The eNodeB shall be synchronized to the GPS time. With external source of CDMA System Time disconnected, the eNodeB shall maintain the timing accuracy within ± 10 µs of CDMA System Time for a period of not less than 8 hours.

The timing deviation between the SFN boundary at or immediately after the ending boundary of the SI-window in which *SystemInformationBlockType8* (containing the broadcasted CDMA System Time with 10-ms granularity) is transmitted and the broadcasted CDMA System Time shall be within 10 µs.

7.5.2.2 Non-Synchronized E-UTRAN

The timing deviation between the SFN boundary at or immediately after the end of the boundary of the SI-window in which SystemInformationBlockType8 (containing the broadcasted CDMA System Time with 8-chip granularity) is transmitted and the broadcasted CDMA System Time shall be within 10 μ s. With external source of CDMA System Time disconnected the SFN boundary at or immediately after the broadcasted CDMA System Time in the SIB8 message shall maintain the timing accuracy within $\pm 10~\mu$ s of CDMA System Time for a period of not less than 8 hours.

7.6 Radio Link Monitoring

7.6.1 Introduction

The UE shall monitor the downlink link quality based on the cell-specific reference signal in order to detect the downlink radio link quality of the PCell as specified in [3].

The UE shall estimate the downlink radio link quality and compare it to the thresholds Q_{out} and Q_{in} for the purpose of monitoring downlink radio link quality of the PCell.

The threshold Q_{out} is defined as the level at which the downlink radio link cannot be reliably received and shall correspond to 10% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.6.1-1.

The threshold Q_{in} is defined as the level at which the downlink radio link quality can be significantly more reliably received than at Q_{out} and shall correspond to 2% block error rate of a hypothetical PDCCH transmission taking into account the PCFICH errors with transmission parameters specified in Table 7.6.1-2.

Table 7.6.1-1 PDCCH/PCFICH transmission parameters for out-of-sync

Attribute	Value
DCI format	1A
Number of control OFDM symbols	2; Bandwidth ≥ 10 MHz
	3; [3] MHz ≤ Bandwidth ≤ 5 MHz
	4; Bandwidth = 1.4 MHz
Aggregation level (CCE)	4; Bandwidth = 1.4 MHz
	8; Bandwidth ≥ 3 MHz
Ratio of PDCCH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell-specific reference signal transmission by the PCell.
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell.
Ratio of PCFICH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell-specific reference signal transmission by the PCell.
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell.

Note 1: DCI format 1A is defined in section 5.3.3.1.3 in 3GPP TS 36.212 [21].

Note 2: A hypothetical PCFICH transmission corresponding to the number of control symbols shall be assumed.

Table 7.6.1-2 PDCCH/PCFICH transmission parameters for in-sync

Attribute	Value
DCI format	1C
Number of control OFDM symbols	2; Bandwidth ≥ 10 MHz
	3; 3 MHz ≤ Bandwidth ≤ 5 MHz
	4; Bandwidth = 1.4 MHz
Aggregation level (CCE)	4
Ratio of PDCCH RE energy to average RS RE energy	0 dB; when single antenna port is used for cell- specific reference signal transmission by the PCell.
	-3 dB; when two or four antenna ports are used for cell-specific reference signal transmission by the PCell.
Ratio of PCFICH RE energy to average RS RE energy	4 dB; when single antenna port is used for cell- specific reference signal transmission by the PCell.
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the PCell.
Note 1: DCI format 1C is defined in	in section 5.3.3.1.4 in 3GPP TS 36.212 [21].
Note 2: A hypothetical PCFICH tra control symbols shall be a	ansmission corresponding to the number of assumed.

7.6.2 Requirements

7.6.2.1 Minimum requirement when no DRX is used

When the downlink radio link quality of the PCell 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 for the PCell 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 [2].

When the downlink radio link quality of the PCell 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 for the PCell 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 [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in section 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least 10 ms.

The transmitter power of the UE shall be turned off within [40] ms after expiry of T310 timer as specified in section 5.3.11 in [2].

7.6.2.2 Minimum requirement when DRX is used

When DRX is used the Q_{out} evaluation period (T_{Evaluate} Q_{out DRX}) and the Q_{in} evaluation period (T_{Evaluate} Q_{in DRX}) is specified in Table 7.6.2.2-1 will be used.

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ _ Q_{out_DRX} [s] period becomes worse than the threshold Qout, Layer 1 of the UE shall send out-of-sync indication for the PCell to the higher layers within T_{Evaluate} Q_{out DRX} [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in [2].

When the downlink radio link quality of the PCell estimated over the last $T_{Evaluate}$ Q_{in_DRX} [s] period becomes better than the threshold Q_{in}, Layer 1 of the UE shall send in-sync indications for the PCell to the higher layers within T_{Evaluate} Q_{in DRX} [s] evaluation period. A L3 filter shall be applied to the in-sync indications as specified in [2].

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in section 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX_cycle_length).

Upon start of T310 timer as specified in section 5.3.11 in [2], the UE shall monitor the link for recovery using the evaluation period and Layer 1 indication interval corresponding to the non-DRX mode until the expiry or stop of T310 timer.

The transmitter power of the UE shall be turned off within 40 ms after expiry of T310 timer as specified in section 5.3.11 in [2].

7.6.2.3 Minimum requirement at transitions

The out-of-sync and in-sync evaluations of the PCell shall be performed as specified in section 4.2.1 in [3]. Two successive indications from Layer 1 shall be separated by at least max(10 ms, DRX cycle length).

When the UE transitions between DRX and non-DRX or when DRX cycle periodicity changes, for a duration of time equal to the evaluation period corresponding to the second mode after the transition occurs, the UE shall use an evaluation period that is no less than the minimum of evaluation periods corresponding to the first mode and the second mode. Subsequent to this duration, the UE shall use an evaluation period corresponding to the second mode. This requirement shall be applied to both out-of-sync evaluation and in-sync evaluation of the PCell.

Table 7.6.2.2-1: Qout and Qin Evaluation Period in DRX

DRX cycle length (s)	$T_{Evaluate}Q_{out_DRX}$ and
	T _{Evaluate} _Q _{in_DRX} (s) (DRX cycles)
≤ 0.01	Non-DRX requirements in section
	7.6.2.1 are applicable.
0.01 < DRX cycle ≤0.04	Note (20)
0.04 < DRX cycle ≤ 0. 64	Note (10)
0.64 < DRX cycle ≤ 2.56	Note (5)
Note: Evaluation period length in time depends on the length of the	

DRX cycle in use

8 UE Measurements Procedures in RRC_CONNECTED State

8.1 General Measurement Requirements

8.1.1 Introduction

This section contains requirements on the UE regarding measurement reporting in RRC_CONNECTED state. The requirements are split in E-UTRA intra frequency, E-UTRA inter frequency, Inter-RAT UTRA FDD, UTRA TDD and GSM measurements. These measurements may be used by the E-UTRAN, e.g. for handover decisions. The measurement quantities are defined in [4], the measurement model is defined in [22] and measurement accuracies are specified in section 9. Control of measurement reporting is specified in [2].

8.1.2 Requirements

8.1.2.1 UE measurement capability

If the UE requires measurement gaps to identify and measure inter-frequency and/or inter-RAT cells, in order for the requirements in the following subsections to apply the E-UTRAN must provide a single measurement gap pattern with constant gap duration for concurrent monitoring of all frequency layers and RATs.

During the measurement gaps the UE:

- shall not transmit any data
- is not expected to tune its receiver on the E-UTRAN serving carrier frequency.

Inter-frequency and inter-RAT measurement requirements within this section rely on the UE being configured with one measurement gap pattern. UEs shall only support those measurement gap patterns listed in Table 8.1.2.1-1 that are relevant to its measurement capabilities.

Gap Pattern MeasurementGap Measurement Gap Minimum available time **Measurement Purpose** ld Length (MGL, ms) **Repetition Period** for inter-frequency and (MGRP, ms) inter-RAT measurements during 480ms period (Tinter1, ms) Inter-Frequency E-UTRAN 0 6 40 60 FDD and TDD, UTRAN FDD, GERAN, LCR TDD, HRPD, CDMA2000 1x 80 30 Inter-Frequency E-UTRAN 1 6 FDD and TDD, UTRAN FDD, GERAN, LCR TDD, HRPD, CDMA2000 1x

Table 8.1.2.1-1: Gap Pattern Configurations supported by the UE

[Editor's note: Further patterns still need to be defined in order to fulfil all required Inter-RAT monitoring purposes.]

NOTE 1: For E-UTRAN FDD, the UE shall not transmit in the subframe occurring immediately after the measurement gap.

NOTE 2: For E-UTRAN TDD, the UE shall not transmit in the uplink subframe occurring immediately after the measurement gap if the subframe occurring immediately before the measurement gap is a downlink subframe.

NOTE 3: When inter-frequency RSTD measurements are configured as a part of the measurement configuration only Gap Pattern 0 can be used. For defining the inter-frequency and inter-RAT requirements $T_{inter} = 30 \text{ms}$ shall be assumed.

The requirements in section 9 are applicable for a UE performing measurements according to this section.

8.1.2.1.1 Monitoring of multiple layers using gaps

When monitoring of multiple inter-frequency E-UTRAN and inter-RAT (UTRAN, GSM) using gaps is configured, the UE shall be capable of performing one measurement of the configured measurement type (RSRP, RSRQ, UTRAN TDD P-CCPCH RSCP, UTRAN FDD CPICH measurements, GSM carrier RSSI, etc.) of detected cells on all the layers

The effective total number of frequencies excluding the serving frequency being monitored using gaps is N_{freq} , which is defined as:

$$N_{freq} = N_{freq, \, E\text{-}UTRA} + N_{freq, \, UTRA} + M_{gsm} + N_{freq, \, cdma2000} + N_{freq, \, HRPD}$$

where

N_{freq, E-UTRA} is the number of E-UTRA carriers being monitored (FDD and TDD)

 $N_{\text{freq, UTRA}}$ is the number of UTRA carriers being monitored (FDD and TDD)

 M_{GSM} is an integer which is a function of the number of GSM carriers on which measurements are being performed. M_{GSM} is equal to 0 if no GSM carrier is being monitored. For a MGRP of 40 ms, M_{GSM} is equal to 1 if cells on up to 32 GSM carriers are being measured. For a MGRP of 80 ms, M_{GSM} is equal to ceil($N_{carriers,GSM}$ /20) where $N_{carriers,GSM}$ is the number of GSM carriers on which cells are being measured.

N_{freq, cdma2000} is the number of cdma2000 1x carriers being monitored

N_{freq, HRPD} is the number of HRPD carriers being monitored

8.1.2.1.1.1 Maximum allowed layers for multiple monitoring

The UE shall be capable of monitoring using gaps at least per RAT group:

- Depending on UE capability, 3 FDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 3 TDD E-UTRA inter-frequency carriers, and
- Depending on UE capability, 3 FDD UTRA carriers, and
- Depending on UE capability, 3 TDD UTRA carriers, and
- Depending on UE capability, 32 GSM carriers (one GSM layer corresponds to 32 cells), and
- Depending on UE capability, 5 cdma2000 1x carriers, and
- Depending on UE capability, 5 HRPD carriers

In addition to the requirements defined above, the UE shall be capable of monitoring using gaps a total of at least 7 carrier frequency layers comprising of any above defined combination of E-UTRA FDD, E-UTRA TDD, UTRA FDD, UTRA TDD, GSM (one GSM layer corresponds to 32 carriers), cdma2000 1x and HRPD layers.

8.1.2.2 E-UTRAN intra frequency measurements

The UE shall be able to identify new intra-frequency cells and perform RSRP measurements of identified intra-frequency cells without an explicit intra-frequency neighbour cell list containing physical layer cell identities. During the RRC_CONNECTED state the UE shall continuously measure identified intra frequency cells and additionally search for and identify new intra frequency cells.

8.1.2.2.1 E-UTRAN FDD intra frequency measurements

8.1.2.2.1.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within

$$T_{identify\ intra} = T_{basic_identify_E-UTRA_FDD,\,intra} \cdot \frac{T_{Measurement_Period,\,Intra}}{T_{Intra}} \quad \textit{ms}$$

where

T_{basic_identify_E-UTRA_FDD, intra} is 800 ms

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} \geq -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH $\hat{E}s/Iot \geq$ 6 dB.
- SCH_RP $|_{dBm} \ge -126 dBm$ for Band 9 and SCH Ês/Iot $\ge -6 dB$,
- SCH_RP $|_{dBm} \ge$ -125 dBm for Bands 2, 5, 7 and SCH Ês/Iot \ge -6 dB,
- SCH_RP $|_{dBm} \ge -124 \text{ dBm}$ for Bands 3, 8, 12, 13, 14, 17, 20 and SCH \triangle s/Iot $\ge -6 \text{ dB}$.

 $T_{\text{Measurement Period,Intra}} = 200 \text{ ms.}$ The measurement period for Intra frequency RSRP measurements.

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRPand 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 $Y_{\text{measurement intra}}$ cells , where $Y_{\text{measurement intra}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra}}$ cells, the UE shall perform measurements of at least 8 identified intra- frequency cells but the reporting rate of RSRP and RSRQ measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ \boldsymbol{X}_{\text{basic measurement FDD}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period, Intra}}} \right\} \text{cells}$$

where

 $X_{\text{basic measurement FDD}} = 8 \text{ (cells)}$

 $T_{\text{Measurement_Period, Intra}} = 200 \text{ ms.}$ 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 the sub-clause 9.1.

8.1.2.2.1.1.1 Measurement Reporting Requirements

8.1.2.2.1.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.2.1.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.1.1.1.3 Event Triggered Reporting.

8.1.2.2.1.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. 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 Section 8.1.2.2.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in section 8.1.2.2.1.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period,\ Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.2.1.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD intra frequency cell within $T_{identify_intra}$ as shown in table 8.1.2.2.1.2-1

Table 8.1.2.2.1.2-1: Requirement to identify a newly detectable FDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra} (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)
cycle≤0.08	
0.128	3.2 (25)
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)
cycle≤2.56	
Note1: Number of DRX cycle	
depends upon the DRX cycle in use	

Note2: Time depends upon the DRX

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,

cycle in use

- SCH_RP $_{\text{dBm}} \ge -127$ dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH Ês/Iot ≥ -6 dB.

- SCH_RP|_{dBm}≥ -126 dBm for Band 9 and SCH Ês/Iot > 6 dB,
- SCH RP $|_{dBm} \ge -125$ dBm for Bands 2, 5, 7 and SCH \hat{E} s/Iot > -6 dB,
- SCH_RP $|_{dBm} \ge -124 \text{ dBm}$ for Bands 3, 8, 12, 13, 14, 17, 20 and SCH $\hat{E}s/Iot \ge -6 \text{ dB}$.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra}$ as shown in table 8.1.2.2.1.2-2. 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 $T_{measure_intra}$.

Table 8.1.2.2.1.2-2: Requirement to measure FDD intrafrequency cells

DRX cycle length (s)	T _{measure_intra} (s) (DRX cycles)
≤0.04	0.2 (Note1)
0.04 <drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)
cycle≤2.56	
Note1: Number of DRX cycle	
depends upon the DRX cycle in use	
Note2: Time depends upon the DRX	

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

cycle in use

8.1.2.2.1.2.1 Measurement Reporting Requirements

8.1.2.2.1.1.2.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9

8.1.2.2.1.1.2.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.1.1.2.3 Event Triggered Reporting.

8.1.2.2.1.1.2.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in 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 Section 8.1.2.2.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in section 8.1.2.2.1.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.2.2 E-UTRAN TDD intra frequency measurements

8.1.2.2.2.1 E-UTRAN intra frequency measurements when no DRX is used

When no DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within

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

where

T_{basic identify E-UTRA TDD, intra} is 800 ms

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP > -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH Ês/Iot > 6 dB,
- SCH RP > -126 dBm for Band 41 and SCH \hat{E} s/Iot > -6 dB.

 $T_{\text{Measurement Period Intra}} = 200 \text{ ms.}$ The measurement period for Intra frequency RSRP measurements.

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of $T_{Measurement_Period\ Intra}$. If higher layer filtering is used, an additional cell identification delay can be expected.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is 200 ms. When no measurement gaps are activated, the UE shall be capable of performing RSRP measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least $Y_{\text{measurement intra}}$ cells , where $Y_{\text{measurement intra}}$ is defined in the following equation. If the UE has identified more than $Y_{\text{measurement intra}}$ cells, the UE shall perform measurements of at least 8 identified intra-frequency cells but the reporting rate of RSRP measurements of cells from UE physical layer to higher layers may be decreased.

$$\mathbf{Y}_{\text{measurement intra}} = Floor \left\{ X_{\text{basic measurement TDD}} \cdot \frac{\mathbf{T}_{\text{Intra}}}{\mathbf{T}_{\text{Measurement_Period, Intra}}} \right\} \text{cells}$$

where

 $X_{\text{basic measurement TDD}} = 8 \text{ (cells)}$

 $T_{\text{Measurement_Period Intra}} = [200]$ ms. The measurement period for Intra frequency RSRP measurements.

 T_{Intra} : This is the minimum time that is available for intra frequency measurements, during the measurement period with an arbitrarily chosen timing. Time is assumed to be available for performing intra frequency measurements whenever the receiver is guaranteed to be active on the intra frequency carrier.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.2.2.1.1 Measurement Reporting Requirements

8.1.2.2.2.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.2.2.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.2.1.1.3 Event Triggered Reporting.

8.1.2.2.2.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in 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 Section 8.1.2.2.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in section 8.1.2.2.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period\ Intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.2.2.2 E-UTRAN intra frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable TDD intra frequency cell within $T_{identify_intra}$ as shown in table 8.1.2.2.2.2-1

Table 8.1.2.2.2.2-1: Requirement to identify a newly detectable TDD intrafrequency cell

DRX cycle length (s)	T _{identify_intra} (s) (DRX cycles)
≤0.04	0.8 (Note1)
0.04 <drx-< td=""><td>Note2 (40)</td></drx-<>	Note2 (40)
cycle≤0.08	
0.128	3.2 (25)
0.128 <drx-< td=""><td>Note2(20)</td></drx-<>	Note2(20)
cycle≤2.56	

Note1: Number of DRX cycle depends upon the DRX cycle in use Note2: Time depends upon the DRX cycle in use

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP \geq -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH \hat{E} s/Iot \geq -6 dB,
- SCH_RP \geq -126 dBm for Band 41 and SCH \hat{E} s/Iot \geq 6 dB.

In the RRC_CONNECTED state the measurement period for intra frequency measurements is $T_{measure_intra}$ as shown in table 8.1.2.2.2.2-2. 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 $T_{measure_intra}$.

Table 8.1.2.2.2.2: Requirement to measure TDD intra frequency cells

DRX cycle length (s)	T _{measure_intra} (s) (DRX cycles)	
≤0.04	0.2 (Note1)	
0.04 <drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)	
cycle≤2.56		
Note1: Number of DRX cycle depends upon the DRX cycle in use.		
Note2: Time depends upon the DRX cycle in use.		

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.2.2.1 Measurement Reporting Requirements

8.1.2.2.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section q

8.1.2.2.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.2.1.3 Event Triggered Reporting.

8.1.2.2.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in 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: $[2] \times TTI_{DCCH}$. 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 Section 8.1.2.2.2.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_intra}$ defined in section 8.1.2.2.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_intra}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.2.3 E-UTRAN FDD intra frequency measurements with autonomous gaps

8.1.2.2.3.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous

gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI, intra}} = T_{\text{basic identify CGI, intra}}$$
 ms

Where

 $T_{basic_identify_CGI, intra} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP|dBm \geq -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH $\hat{E}s/Iot \geq$ -6 dB,
- SCH_RP|dBm \geq -126 dBm for Band 9 and SCH Ês/Iot \geq -6 dB,
- SCH_RP|dBm \geq -125 dBm for Bands 2, 5, 7 and SCH Ês/Iot \geq -6 dB,
- SCH_RP|dBm \geq -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH Ês/Iot \geq -6 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [2] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than [60] ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

8.1.2.2.3.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

8.1.2.2.4 E-UTRAN TDD intra frequency measurements with autonomous gaps

8.1.2.2.4.1 Identification of a new CGI of E-UTRA cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose 'reportCGI'. The UE may make autonomous gaps in downlink reception and uplink transmission for receiving MIB and SIB1 messages according to section 5.5.3.1 of 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI, intra}} = T_{\text{basic identify CGI, intra}}$$
 ms

Where

 $T_{basic_identify_CGI,\ intra} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of an E-UTRA cell is defined.

A cell shall be considered identifiable when the following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP \geq -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH £s/Iot \geq 6 dB,
- SCH_RP \geq -126 dBm for Band 41 and SCH \hat{E} s/Iot \geq -6 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI, intra}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [2] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall be able to transmit at least the number of ACK/NACKs stated in Table 8.1.2.2.4.1-1 during the identification of a new CGI of E-UTRA cell.

Table 8.1.2.2.4.1-1: Requirement on minimum number of ACK/NACKs to transmit during T_{basic_identify_CGI, intra}.

UL/DL configuration	Minimum number of transmitted ACK/NACKs	
0	[18]	
1	[35]	
2	[43]	
3	[36]	
4	[39]	
5	[42]	
6	[30]	

8.1.2.2.4.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

8.1.2.3 E-UTRAN inter frequency measurements

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.

8.1.2.3.1 E-UTRAN FDD – FDD inter frequency measurements

8.1.2.3.1.1 E-UTRAN FDD – FDD inter frequency measurements when no DRX is used

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:

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Interl}}} \cdot N_{\text{freq}} \quad \textit{ms}$$

Where:

 $T_{Basic_Identify_Inter} = 480$ ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new FDD inter-frequency cell is defined.

 N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP|_{dBm} \ge -125 dBm and for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and RSRP \hat{E} s/Iot \ge -4 dB,
- RSRP $|_{dBm} \ge -124 dBm$ for Bands 9 and RSRP Ês/Iot $\ge -4 dB$,
- RSRP $|_{dBm} \ge -123$ dBm for Bands 2, 5, 7 and RSRP $\hat{E}s/Iot \ge -4$ dB,
- RSRP_{|dBm} \geq -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP £s/Iot \geq -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH_RP|_{dBm} \geq -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH £s/Iot \geq -4 dB,

- SCH_RP $|_{dBm} \ge -124 dBm$ for Band 9 and SCH Ês/Iot $\ge -4 dB$,
- SCH RP $|_{dBm} \ge -123$ dBm for Bands 2, 5, 7 and SCH \hat{E} s/Iot ≥ -4 dB,
- SCH_RP $|_{dBm}$ ≥ -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH Ês/Iot ≥ -4 dB.

When measurement gaps are scheduled for FDD inter frequency measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in sub-clause 9.1.3 with measurement period given by table 8.1.2.3.1.1-1.

Table 8.1.2.3.1.1-1: RSRP measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: T _{Measurement_Period_Inter_FDD} [ms]	Measurement bandwidth [RB]
0	480 x N _{freq}	6
1 (Note)	240 x N _{freq}	50
Note: This configura	1004	00

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 8.1.2.3.1.1-1.

8.1.2.3.1.1.1 Measurement Reporting Requirements

8.1.2.3.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.3.1.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

8.1.2.3.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in 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: $2 \times TTI_{DCCH}$. 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 Section 8.1.2. 3.1.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_inter}$ defined in section 8.1.2.3.1.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_Inter_FDD}$ defined in section 8.1.2.3.1.1 provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.3.1.2 E-UTRAN FDD – FDD inter frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN FDD inter frequency cell within $T_{identify\ inter}$ as shown in table 8.1.2.3.1.2-1

Table 8.1.2.3.1.2-1: Requirement to identify a newly detectable FDD interfrequency cell

DRX	T _{identify_inter} (s) (DRX cycles)			
cycle	Gap period	Gap period		
length (s)	=40 ms	= 80 ms		
≤0.16	Non DRX	Non DRX		
	Requirements	Requirements		
	in section	in section		
	8.1.2.3.1.1	8.1.2.3.1.1		
	are applicable	are applicable		
0.256	5.12*N _{freq}	$7.68*N_{freq}$		
	(20*Nfreq)	(30*N _{freq})		
0.32	6.4*N _{freq}	$7.68*N_{freq}$		
	(20*Nfreq)	(24*N _{freq})		
0.32<	Note	Note		
DRX-	(20*N _{freq})	(20*N _{freq})		
cycle≤2.56	(4)	(4)		
Note: Time depends upon the DRX				
	cycle in use			

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP $|_{dBm} \ge -125 \text{ dBm}$ and for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and RSRP Ês/Iot $\ge -4 \text{ dB}$,
- RSRP $|_{dBm} \ge -124 dBm$ for Bands 9 and RSRP \hat{E} s/Iot $\ge -4 dB$,
- RSRP $|_{dBm} \ge -123$ dBm for Bands 2, 5, 7 and RSRP $\hat{E}s/Iot \ge -4$ dB,
- RSRP $|_{dBm} \ge$ -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP $\hat{E}_s/Iot \ge -4$ dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH_RP|_{dBm} \geq -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH £s/Iot \geq -4 dB,
- SCH_RP $|_{dBm} \ge -124 dBm$ for Band 9 and SCH Ês/Iot $\ge -4 dB$,
- SCH_RP $|_{dBm} \ge -123$ dBm for Bands 2, 5, 7 and SCH $\hat{E}s/Iot \ge -4$ dB,
- SCH_RP $|_{dBm}$ ≥ -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH Ês/Iot ≥ -4 dB.

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in table 8.1.2.3.1.2-2.

Table 8.1.2.3.1.2-2: Requirement to measure FDD interfrequency cells

DRX cycle length (s)	T _{measure_inter} (s) (DRX cycles)	
≤0.08	Non DRX	
	Requirements in	
	section 8.1.2.3.1.1	
	are applicable	
0.08 <drx-< td=""><td>Note (5*N_{freq})</td></drx-<>	Note (5*N _{freq})	
cycle≤2.56	·	
Note: Time depends upon the DRX		
cycle in use		

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.3.1.2.1 Measurement Reporting Requirements

8.1.2.3.1.1.2.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.3.1.1.2.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.5 Event Triggered Reporting.

8.1.2.3.1.1.2.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in 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: $2 \times \text{TTI}_{DCCH}$. 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 Section 8.1.2. 3.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_inter}$ defined in section 8.1.2.3.1.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measure_inter}$ defined in section 8.1.2.3.1.2 provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.3.2 E-UTRAN TDD – TDD inter frequency measurements

8.1.2.3.2.1 E-UTRAN TDD – TDD inter frequency measurements when no DRX is used

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:

$$T_{\text{Identify_Inter}} = T_{\text{Basic_Identify_Inter}} \cdot \frac{480}{T_{\text{Inter1}}} \cdot N_{\text{freq}} \quad \textit{ms}$$

Where:

 $T_{Basic_Identify_Inter} = 480$ ms. It is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new TDD inter-frequency cell is defined.

 N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP $|_{dBm} \ge -125 \text{ dBm}$ and for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and RSRP Ês/Iot $\ge -4 \text{ dB}$,
- RSRP $|_{dBm} \ge -124$ dBm and for Band 41and RSRP Ês/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled,

- SCH_RP|_{dBm}≥ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH \hat{E} s/Iot ≥ -4 dB,
- SCH RP $_{dBm} \ge -124$ dBm for Band 41 and SCH \hat{E} s/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 sub-clause 9.1.3 with measurement period ($T_{\text{Measurement_Period_TDD_Inter}$) given by table 8.1.2.3.2.1-1:

Table 8.1.2.3.2.1-1: T_{Measurement_Period_TDD_Inter} for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub- frames per half frame (5 ms)		Dw	PTS	T _{Measurement_Period_TDD} _Inter [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_{\rm s}$	$20480 \cdot T_{\rm s}$	480 x N _{freq}
1 (Note 1)	50	2	2	$19760 \cdot T_{\rm s}$	$20480 \cdot T_{\rm s}$	240 x N _{freq}

Note 1: This configuration is optional

Note 2: T_s is defined in 3GPP TS 36.211 [16]

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per TDD inter-frequency and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period $T_{\text{Measurement_Period_TDD_Inter}}$.

8.1.2.3.2.1.1 Measurement Reporting Requirements

8.1.2.3.2.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.3.2.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.2.1.1.3 Event Triggered Reporting.

8.1.2.3.2.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter}$ defined in Section 8.1.2.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify_Inter}$ defined in section 8.1.2.3.2.1 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{Measurement_Period_TDD_Inter}$ defined in section 8.1.2.3.2.1 provided the timing to that cell has not changed more than \pm 50 Ts while measurementgap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.3.2.2 E-UTRAN TDD – TDD inter frequency measurements when DRX is used

When DRX is in use the UE shall be able to identify a new detectable E-UTRAN TDD inter frequency cell within $T_{identify_inter}$ as shown in table 8.1.2.3.2.2-1

Table 8.1.2.3.2.2-1: Requirement to identify a newly detectable TDD interfrequency cell

DRX cycle	T _{identify_inter} (s) (DRX cycles)		
length (s)	Gap period	Gap period	
	= 40 ms	= 80 ms	
≤0.16	Non DRX	Non DRX	
	Requirements	Requirements	
	in section	in section	
	8.1.2.3.2.1	8.1.2.3.2.1	
	are applicable	are applicable	
0.256	5.12*Nfreq	7.68*Nfreq	
	(20*Nfreq)	(30*Nfreq)	
0.32	6.4*Nfreq	7.68*Nfreq	
	(20*Nfreq)	(24*Nfreq)	
0.32 <drx-< td=""><td>Note</td><td>Note</td></drx-<>	Note	Note	
cycle≤2.56	(20*Nfreq)	(20*Nfreq)	
Note: Time depends upon the DRX			
cycle in use			

A cell shall be considered detectable provided following conditions are fulfilled:

- RSRP $|_{dBm} \ge -125 \text{ dBm}$ and for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and RSRP $\hat{E}s/Iot \ge -4 \text{ dB}$,
- RSRP $|_{dBm} \ge -124$ dBm and for Band 41 and RSRP \hat{E} s/Iot ≥ -4 dB,
- RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH_RP|_{dBm}≥ -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 and SCH \hat{E} s/Iot ≥ -4 dB,
- SCH_RP $|_{dBm} \ge -124 \text{ dBm}$ for Band 41 and SCH Ês/Iot $\ge -4 \text{ dB}$.

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 defined in Table 8.1.2.3.2.2-2.

Table 8.1.2.3.2.2-2: Requirement to measure TDD interfrequency cells

DRX cycle length (s)	T _{measure_inter} (s) (DRX cycles)	
≤0.08	Non DRX	
	Requirements in	
	section 8.1.2.3.2.1	
	are applicable	
0.08 <drx-< td=""><td>Note (5*N_{freq})</td></drx-<>	Note (5*N _{freq})	
cycle≤2.56	·	
Note: Time	Time depends upon the	
DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.3.2.2.1 Measurement Reporting Requirements

8.1.2.3.2.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.3.2.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.3.2.2.1.3 Event Triggered Reporting.

8.1.2.3.2.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI_{DCCH}. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{Identify_Inter}$ defined in Section 8.1.2.3.2.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{Identify_Inter}$ in section 8.1.2.3.2.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measure_inter}$ in section 8.1.2.3.2.2 provided the timing to that cell has not changed more than \pm 50 Ts while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.3.3 E-UTRAN TDD – FDD inter frequency measurements

8.1.2.3.3.1 E-UTRAN TDD – FDD inter frequency measurements when no DRX is used

The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 8.1.2.3.1.1 also apply for this section.

8.1.2.3.3.2 E-UTRAN TDD – FDD inter frequency measurements when DRX is used

The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 8.1.2.3.1.2 also apply for this section.

8.1.2.3.3.2 (Void)

8.1.2.3.4 E-UTRAN FDD – TDD inter frequency measurements

8.1.2.3.4.1 E-UTRAN FDD – TDD inter frequency measurements when no DRX is used

The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 8.1.2.3.2.1 also apply for this section.

8.1.2.3.4.2 E-UTRAN FDD – TDD inter frequency measurements when DRX is used

The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 8.1.2.3.2.2 also apply for this section.

8.1.2.3.5 E-UTRAN FDD-FDD inter frequency measurements with autonomous gaps

8.1.2.3.5.1 Identification of a new CGI of E-UTRA FDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI, inter}} = T_{\text{basic identify CGI, inter}}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP|dBm \geq -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH Ês/Iot \geq -4 dB,
- SCH_RP|dBm > -124 dBm for Band 9 and SCH Ês/Iot > -4 dB,
- SCH_RP|dBm \geq -123 dBm for Bands 2, 5, 7 and SCH \hat{E} s/Iot \geq -4 dB,
- SCH_RP|dBm \geq -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH Ês/Iot \geq -4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [2] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than [60] ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

8.1.2.3.5.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

8.1.2.3.6 E-UTRAN TDD-FDD inter frequency measurements using autonomous gaps

The requirements in this section shall apply to UE supporting FDD and TDD.

8.1.2.3.6.1 Identification of a new CGI of E-UTRA FDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission for receiving MIB and SIB1 message according to section 5.5.3.1 of 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify CGI, inter}} = T_{\text{basic identify CGI, inter}}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP|dBm \geq -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24 and SCH Ês/Iot \geq -4 dB,
- SCH_RP|dBm > -124 dBm for Band 9 and SCH Ês/Iot > -4 dB,
- SCH_RP|dBm \geq -123 dBm for Bands 2, 5, 7 and SCH \hat{E} s/Iot \geq -4 dB,
- SCH_RP|dBm \geq -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH £s/Iot \geq -4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [2] are used.

Given that continuous DL data allocation and no DRX is used, no measurement gaps are configured, and TDD configuration as in Table 8.1.2.3.2.1-1 is used, the UE shall have more than [30] ACK/NACK transmitted during the identification of a new CGI of E-UTRA cell.

8.1.2.3.6.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

8.1.2.3.7 E-UTRAN TDD-TDD inter frequency measurements with autonomous gaps

8.1.2.3.7.1 Identification of a new CGI of E-UTRA TDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission according to section 5.5.3.1 of 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{\text{identify_CGI, inter}} = T_{\text{basic_identify_CGI, inter}}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP > -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 and SCH Ês/Iot > 4 dB.
- SCH_RP > -126 dBm for Band 41 and SCH \hat{E} s/Iot > 4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [2] are used.

Given that continuous DL data allocation and no DRX is used, no measurement gaps are configured, and TDD configuration as in Table 8.1.2.3.2.1-1 is used, the UE shall have more than [30] ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

8.1.2.3.7.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

8.1.2.3.8 E-UTRAN FDD-TDD inter frequency measurements using autonomous gaps

The requirements in this section shall apply to UE supporting FDD and TDD.

The requirements in section 8.1.2.3.7 also apply for this section.

8.1.2.3.8.1 Identification of a new CGI of E-UTRA TDD cell with autonomous gaps

No explicit neighbour list is provided to the UE for identifying a new CGI of E-UTRA cell. The UE shall identify and report the CGI when requested by the network for the purpose of 'reportCGI'. The UE may make autonomous gaps in both downlink reception and uplink transmission according to section 5.5.3.1 of 36.331 [2]. Note that a UE is not required to use autonomous gap if si-RequestForHO is set to false. If autonomous gaps are used for measurement with the purpose of 'reportCGI', regardless of whether DRX is used or not, the UE shall be able to identify a new CGI of E-UTRA cell within:

$$T_{identify_CGI, inter} = T_{basic_identify_CGI, inter}$$
 ms

Where

 $T_{basic_identify_CGI, inter} = 150$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new CGI of E-UTRA cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP > -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 and SCH Ês/Iot > 4 dB.

The requirement for identifying a new CGI of an E-UTRA cell within $T_{basic_identify_CGI,inter}$ is applicable when no DRX is used as well as when all the DRX cycles specified in 3GPP TS 36.331 [2] are used.

Given that continuous DL data allocation and no DRX is used, and no measurement gaps are configured, the UE shall have more than [60] ACK/NACKs transmitted during the identification of a new CGI of E-UTRA cell.

8.1.2.3.8.2 ECGI Reporting Delay

The ECGI reporting delay occurs due to the delay uncertainty when inserting the ECGI measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. In case DRX is used, the ECGI reporting may be delayed until the next DRX cycle.

8.1.2.4 Inter RAT measurements

8.1.2.4.1 E-UTRAN FDD – UTRAN FDD measurements

8.1.2.4.1.1 E-UTRAN FDD – UTRAN FDD measurements when no DRX is used

8.1.2.4.1.1.1 Identification of a new UTRA FDD cell

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

$$\mathbf{T}_{\text{identify, UTRA_FDD}} = \mathbf{T}_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\mathbf{T}_{\text{interl}}} \cdot N_{\textit{Freq}} \quad \textit{ms}$$

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.

8.1.2.4.1.1.1a Enhanced UTRA FDD cell identification requirements

When explicit neighbour list is provided and no DRX is used or when DRX cycle length \leq 40 ms the UE shall be able to identify a new detectable cell belonging to the monitored set within $T_{identify,\,enhanced_UTRA_FDD}$:

$$T_{\text{identify, enhanced_UTRA_FDD}} = (T_{\text{basic_identify_enhanced_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} + 480) N_{\text{Freq}} \quad ms$$

A cell shall be considered detectable when:

- CPICH Ec/Io > -15 dB,
- SCH_Ec/Io ≥ -15 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.

8.1.2.4.1.1.2 UE UTRA FDD CPICH measurement capability

When measurement gaps are scheduled for UTRA FDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Section 9.2 with measurement period given by

$$T_{\text{measurement_UTRA_FDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_FDD}}, T_{\text{basic_measurement_UTRA_FDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot N_{\text{Freq}} \right\} ms$$

If the UE does not need measurement gaps to perform UTRA FDD measurements, the measurement period for UTRA FDD measurements is 480 ms.

The UE shall be capable of performing UTRA FDD CPICH measurements for $X_{basic\ measurementUTRA_FDD}$ inter-frequency cells per FDD frequency and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement\ UTRA\ FDD}$.

 $X_{basic\ measurement\ UTRA_FDD} = 6$

 $T_{\text{Measurement_Period UTRA_FDD}} = 480 \text{ ms. The period used for calculating the measurement period } T_{\text{measurement_UTRA_FDD}}$ for UTRA FDD CPICH measurements.

 $T_{basic_identify_UTRA_FDD} = 300$ ms. This is the time period used in the inter RAT equation in section 8.1.2.4.1.1.1 where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

 $T_{basic_identify_enhanced_UTRA_FDD} = 60$ ms. This is the time period used in the inter RAT equation in section 8.1.2.4.1.1.1a where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

 $T_{basic_measurement_UTRA_FDD} = 50$ ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

 N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

8.1.2.4.1.1.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.1.1.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,\ UTRA_FDD}$ defined in Section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\ enhanced_UTRA_FDD}$ defined in Section 8.1.2.4.1.1.1a for the enhanced requirements When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\,UTRA_FDD}$ defined in section 8.1.2.4.1.1.1 for the minimum requirements or $T_{identify,\,enhanced_UTRA_FDD}$ defined in Section 8.1.2.4.1.1.1a for the enhanced requirements and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement_UTRA_FDD}$ defined in section 8.1.2.4.1.1.2 provided the timing to that cell has not changed more than \pm 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.4.1.1.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.4.1.1.4 Event Triggered Reporting.

8.1.2.4.1.2 E-UTRAN FDD – UTRAN FDD measurements when DRX is used

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify,UTRA\ FDD}$ as shown in table 8.1.2.4.1.2-1

Table 8.1.2.4.1.2-1: Requirement to identify a newly detectable UTRA FDD cell

DRX cycle length (s)	T _{identify_UTRA_FDD} (s) (DRX cycles)		
	Gap period =	Gap period	
	40 ms	= 80 ms	
≤0.04	Non DRX	Non DRX	
	Requirements	Requirements	
	in section	in section	
	8.1.2.4.1.1 are	8.1.2.4.1.1	
	applicable	are applicable	
0.064	2.56* Nfreq	4.8* Nfreq	
	(40* Nfreq)	(75* Nfreq)	
0.08	3.2* Nfreq	4.8* Nfreq	
	(40* Nfreq)	(60* Nfreq)	
0.128	2.56* Nfreq	4.8* Nfreq	
	(20* Nfreq)	(37.5* Nfreq)	
0.16	3.2* Nfreq (20*	4.8* Nfreq	
	Nfreq)	(30* Nfreq)	
0.16 <drx-< td=""><td>Note (20*</td><td>Note</td></drx-<>	Note (20*	Note	
cycle≤2.56	Nfreq)	(20* Nfreq)	
Note: Time depends upon the DRX cycle in			
use	use		

A cell shall be considered detectable provided following conditions are fulfilled: 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.

The UE shall be capable of performing RSCP and Ec/Io measurements of at least 6 UTRA cells per UTRA FDD carrier for up to 3 UTRA FDD carriers and the UE physical layer shall be capable of reporting RSCP and Ec/Io measurements to higher layers with the measurement period defined in table 8.1.2.3.1.2-2.

DRX cycle T_{measure_UTRA_FDD} (s) (DRX length (s) cycles) Gap period = Gap period = 40 ms 80 ms ≤0.04 Non DRX Non DRX Requirements Requirements in section in section 8.1.2.4.1.1 8.1.2.4.1.1 are are applicable applicable 0.8* N_{freq} 0.064 0.48* N_{freq} (7.5* N_{freq}) (12.5* N_{freq}) 0.48* N_{freq} 0.08 0. 8* Nfreq (10* $(6* N_{freq})$ N_{freq}) 0.64* N_{freq} 0.128 0. 8* N_{freq} (5* N_{freq}) (6.25* N_{freq}) 0.128<DRX-Note (5* N_{freq}) Note (5* N_{freq}) cycle≤2.56 Note: Time depends upon the DRX cycle in use

Table 8.1.2.4.1.2-2: Requirement to measure UTRA FDD cells

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.4.1.2.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.1.2.2 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as the reporting criteria is not fulfilled.

The measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit the measurement report over the Uu interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify,UTRA_FDD}$ defined in Section 8.1.2.4.1.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify,\,UTRA_FDD}$ defined in section 8.1.2.4.1.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than $T_{measurement_UTRA_FDD}$ defined in section 8.1.2.4.1.2 provided the timing to that cell has not changed more than \pm 32 chips while measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.1.2.4.1.2.3 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.4.1.2.2 Event Triggered Reporting.

8.1.2.4.2 E-UTRAN TDD – UTRAN FDD measurements

The requirements in section 8.1.2.4.1 also apply for this section.

8.1.2.4.2.1	F-HTRAN TOD -	- LITRAN FDD	measurements when	no DRX is used
0.1.4.4.4.1	L-UINAN IDD -	- טוואאוווט	IIICasulcilicilis Wilcii	110 011/1/13 0360

8.1.2.4.2.2 E-UTRAN TDD – UTRAN FDD measurements when DRX is used

8.1.2.4.3 E-UTRAN TDD – UTRAN TDD measurements

8.1.2.4.3.1 E-UTRAN TDD – UTRAN TDD measurements when no DRX is used

8.1.2.4.3.1.1 Identification of a new UTRA TDD cell

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 > -5 dB.

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

8.1.2.4.3.1.2 UE UTRA TDD P-CCPCH RSCP measurement capability

When measurement gaps are scheduled for UTRA TDD inter RAT measurements the UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in Section 9.3 with measurement period given by

$$T_{\text{measurement UTRA_TDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_TDD}}, T_{\text{basic measurement UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot N_{\text{Freq}} \right\} ms$$

If the UE does not need measurement gaps to perform UTRA TDD measurements, the measurement period for UTRA TDD measurements is 480 ms.

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for $X_{basic\ measurementUTRA_TDD}$ interfrequency cells per TDD frequency of the monitored set, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{Measurement_UTRA_TDD}$.

 $X_{basic\ measurementUTRA_TDD} = 6$

 $T_{Measurement_Period\ UTRA_TDD} = 480\ ms$ is the period used for calculating the measurement period $T_{measurement_UTRA_TDD}$ for UTRA TDD P-CCPCH RSCP measurements.

 $T_{basic_identify_UTRA_TDD} = 800$ ms is the time period used in the inter RAT equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

 $T_{basic_measurement_UTRA_TDD} = 50$ ms is the time period used in the equation for defining the measurement period for inter RAT P-CCPCH RSCP measurements.

 N_{freq} is defined in section 8.1.2.1.1 and T_{inter1} is defined in section 8.1.2.1

8.1.2.4.3.1.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.3.1.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in 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 Section 8.1.2.4.3.1.1 When L3 filtering is used an additional delay can be expected.

8.1.2.4.3.1.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.4.3.1.4 Event Triggered Reporting.

8.1.2.4.3.2 E-UTRAN TDD – UTRAN TDD measurements when DRX is used

When explicit neighbour list is provided and DRX is used the UE shall be able to identify a new detectable cell belonging to the neighbour cell list within $T_{identify,UTRA_TDD}$ as shown in table 8.1.2.4.3.2-1

Table 8.1.2.4.3.2-1: Requirement to identify a newly detectable UTRA TDD cell

DRX cycle	T _{identify_UTRA_TDD} (s) (DRX cycles)		
length (s)	Gap period = 40 ms	Gap period = 80 ms	
≤0.32	Non DRX Requirements in section 8.1.2.4.3.1 are applicable	Non DRX Requirements in section 8.1.2.4.3.1 are applicable	
0.64≤DRX- cycle≤2.56	Note (20* Nfreq)	Note (20* Nfreq)	
Note: Time depends upon the DRX cycle in use			

A cell shall be considered detectable provided following conditions are fulfilled: A cell shall be considered detectable when

- P-CCPCH Ec/Io \geq -8 dB,
- DwPCH_Ec/Io > -5 dB.

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

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements of at least 6 UTRA cells per UTRA TDD carrier for up to 3 UTRA TDD carriers and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period defined in table 8.1.2.4.3.2-2.

Table 8.1.2.4.3.2-2: Requirement to measure UTRA TDD cells

DRX cycle length (s)	T _{measure_UTRA_TDD} (s) (DRX cycles)	
	Gap period = 40	Gap period =
	ms	80 ms
≤0.04	Non DRX	Non DRX
	Requirements in	Requirements in
	section	section
	8.1.2.4.3.1 are	8.1.2.4.3.1 are
	applicable	applicable
0.064	0.48*N _{freq}	0.8*N _{freq}
	(7.5*N _{freq})	(12.5*N _{freq})
0.08	0.48*N _{freq}	0. 8*N _{freq}
	(6*N _{freq})	(10*N _{freq})
0.128	0.64 (5*N _{freq})	0. 8*N _{freq}
	·	(6.25*N _{freq})
0. 128 <drx-< td=""><td>Note (5*N_{freq})</td><td>Note (5*N_{freq})</td></drx-<>	Note (5*N _{freq})	Note (5*N _{freq})
cycle≤2.56	·	•
Note: Time depends upon the DRX cycle in use		

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.

8.1.2.4.3.2.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.3.2.2 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in 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 Section 8.1.2.4.3.2 When L3 filtering is used an additional delay can be expected.

8.1.2.4.3.2.3 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.4.3.2.2 Event Triggered Reporting.

8.1.2.4.4 E-UTRAN FDD – UTRAN TDD measurements

The requirements in section 8.1.2.4.3 also apply for this section.

8.1.2.4.5 E-UTRAN FDD – GSM measurements

8.1.2.4.5.1 E-UTRAN FDD – GSM measurements when no DRX is used

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.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to 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.

8.1.2.4.5.1.1 GSM carrier RSSI

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per measurement gap. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is $N_{freq}*480$ ms. The parameter N_{freq} is defined in section 8.1.2.1.1.

The UE shall meet the measurement accuracy requirements stated for RXLEV in [8], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.1.2.4.5.1.2 BSIC verification

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1.
- **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.

If the network requests measurements on a GSM cell the UE shall behave as follows:

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.1 when a measurement gap pattern sequence is activated.
- The UE shall perform measurement reporting as defined in [2].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to [2].

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 $8*T_{re-confirm,GSM}$ 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.

 $T_{\text{re-confirm,GSM}}$ indicates the maximum time allowed for the re-confirmation of the BSIC of one GSM cell in the BSIC re-confirmation procedure.

The UE shall be able to decode a BSIC within a measurement gap when the time difference between the middle of the received GSM synchronisation burst at the UE and the middle of the effective measurement gap is within the limits specified in table 8.1.2.4.5.1.2-1.

Table 8.1.2.4.5.1.2-1: 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 [9].

8.1.2.4.5.1.2.1 Initial BSIC identification

This measurement shall be based on the measurement gaps used for Initial BSIC identification as described in section 8.1.2.4.5.1.2.

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. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. If interfrequency RSTD measurements are configured as a part of the measurement configuration, $T_{identify,GSM}$ shall be based on the 80ms gap configuration.

Table 8.1.2.4.5.1.2.1-1

Number	T _{identify,qsm} (ms)		$T_{reconfirm,c}$	_{gsm} (ms)
of				
carriers				
other	40ms gap	80ms gap	40ms gap	80ms gap
than	configuration	configuration	configuration	configuration
GSM	(ID 0)	(ID 1)	(ID 0)	(ID 1)
0	2160	5280	1920	5040
1	5280	21760	5040	17280
2	5280	31680	5040	29280
		No		No
3	19440	requirement	13320	requirement
4	31680	No	29280	No

	requirement requireme		requirement		
		No		No	
5	31680	requirement	29280	requirement	

8.1.2.4.5.1.2.2 BSIC re-confirmation

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 section 8.1.2.4.5.1.2, the UE shall attempt to decode the BSIC falling within the measurement gap according to table 8.1.2.4.5.1.2.1-1. If more than one BSIC can be decoded within the same measurement gap, priority shall be given to the least recently decoded BSIC. If inter-frequency RSTD measurements are configured as a part of the measurement configuration, $T_{\text{re-confirm,GSM}}$ shall be based on the 80 ms gap configuration.

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 $T_{\text{re-confirm},GSM}$ seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.4.5.1.2.1.

8.1.2.4.5.1.2a Enhanced BSIC verification

In addition to the BSIC verification requirements in section 8.1.2.4.5.1.2, when the UE receives the GSM cell at levels down to 10~dB + the reference sensitivity level or reference interference levels as specified in [9] the BSIC identification requirement in table 8.1.2.4.5.1.2a-1 applies. The BSIC verification requirements in table 8.1.2.4.5.1.2a-1 shall apply when no DRX is used or when DRX cycle length $\leq 40~ms$.

T_{enhanced_identify,gsm}(ms) $T_{enhanced_reconfirm,gsm}(ms)$ 40ms gap 40ms gap configuration configuration Number when when interfrequency interfrequency of carriers RSTD RSTD other 40ms gap measurement 40ms gap measurement than configuration is also configuration is also **GSM** (ID 0) (ID 0) configured configured 1920 0 1320 2160 1080

Table 8.1.2.4.5.1.2a-1

8.1.2.4.5.1.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.5.1.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in 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.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{\text{Measurement Period, GSM}}$ (see section 8.1.2.4.5.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{\text{Measurement Period, GSM}}$, where $T_{\text{Measurement Period, GSM}}$ is defined in section 8.1.2.4.5.1. When L3 filtering is used an additional delay can be expected.

8.1.2.4.5.1.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.4.5.1.4 Event Triggered Reporting.

8.1.2.4.5.2 E-UTRAN FDD – GSM measurements when DRX is used

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.

In RRC_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells. During DRX periods the UE may use other periods of time outside the specified measurement gap patterns. The UE is not required to make measurements of GSM cells during DRX periods if a measurement gap pattern has not been configured.

8.1.2.4.5.2.1 GSM carrier RSSI

This measurement shall be based on measurement gaps allocated for GSM carrier RSSI measurement as described in section 8.1.2.1. A UE supporting GSM measurements shall measure minimum number of 10 GSM carrier RSSI measurement samples ($N_{GSM\ carrier\ RSSI}$) per DRX cycle. In RRC_CONNECTED state the measurement period, $T_{Measurement\ Period,\ GSM}$, for the GSM carrier RSSI measurement is shown in table 8.1.2.4.5.2.1-1. The parameter N_{freq} is defined in section 8.1.2.1.1.

Table 8.1.2.4.5.2.1-1: GSM measurement period for large DRX

DRX cycle length (s)	T _{measure,GSM} (s) (DRX cycles)	
≤0.04	Non DRX Requirements are	
	applicable	
0.04 <drx-cycle≤ 0.08<="" td=""><td>Note (6*N_{freq})</td></drx-cycle≤>	Note (6*N _{freq})	
0.08 <drx-cycle≤ (5*n<sub="" 2.56="" note="">freq)</drx-cycle≤>		
Note: Time depends upon the DRX cycle in use		

The UE shall meet the measurement accuracy requirements stated for RXLEV in [8], when the given measurement time allows the UE to take at least 3 GSM carrier RSSI samples per GSM carrier in the monitored set during the measurement period.

In case the UE is not able to acquire the required number of samples per GSM carrier during one measurement period, the UE shall measure as many GSM carriers as possible during that measurement period using at least 3 samples per GSM carrier. The GSM carriers that were not measured during that measurement period shall be measured in the following measurement periods.

8.1.2.4.5.2.2 BSIC verification

Measurements on a GSM cell can be requested with BSIC verified. The UE shall be able to report the GSM cells with BSIC verified for those cells where the verification of BSIC has been successful.

The procedure for BSIC verification on a GSM cell can be divided into the following two tasks:

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells.
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern

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

- The UE shall perform GSM carrier RSSI measurements according to section 8.1.2.4.5.2.1 when a measurement gap pattern sequence is activated.

- The UE shall perform measurement reporting as defined in [2].
- The UE shall perform BSIC identification. The UE shall use the most recently available GSM carrier RSSI measurement results for arranging GSM cells in signal strength order for performing BSIC identification.
- The UE shall perform BSIC re-confirmation on all the GSM cells that have been successfully identified.
- The UE shall perform all configured event evaluation for event-triggered reporting after the BSIC has been verified for a GSM cell. The UE shall use the most recently available GSM carrier RSSI measurement results in event evaluation and event-triggered reporting.
- Event-triggered and periodic reports shall be triggered according to [2].

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall be re-confirmed at least once every 30 seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified".

The UE shall be able to perform BSIC verification at levels down to the reference sensitivity level or reference interference levels as specified in [9].

8.1.2.4.5.2.2.1 Initial BSIC identification

This measurement shall be made on GSM cells that are requested with BSIC verified.

For DRX cycle length \leq 40 ms, the initial GSM BSIC identification requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.1 shall apply.

For DRX cycle length > 40 ms, the UE shall make at least one attempt every $N_{freq}*30s$ to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within $N_{freq}*60$ s, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value. The parameter N_{freq} is defined in section 8.1.2.1.1.

If the BSIC of the GSM BCCH carrier has been successfully decoded the UE shall continue BSIC identification with the next GSM BCCH carrier, in signal strength order, with unknown BSIC. The GSM cell for which the BSIC has been successfully identified shall be moved to the BSIC re-confirmation procedure.

8.1.2.4.5.2.2.2 BSIC re-confirmation

The UE shall maintain the timing information of up to 8 identified GSM cells. Initial timing information is obtained from the initial BSIC identification. The timing information shall be updated every time the BSIC is decoded.

For DRX cycle length \leq 40 ms, the GSM BSIC re-conformation requirements corresponding to the non DRX requirements as specified in section 8.1.2.4.5.1.2.2 shall apply.

For DRX cycle length > 40 ms, at least every $N_{\rm freq}$ *30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell. If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within $N_{\rm freq}$ *60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.4.5.2.2.1. The parameter $N_{\rm freq}$ is defined in section 8.1.2.1.1.

8.1.2.4.5.2.3 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

8.1.2.4.5.2.4 Event Triggered Reporting

Reported measurements in event triggered measurement reports shall meet the requirements in 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.

The event triggered reporting delay requirement is valid when the UE for each GSM carrier in the monitored set can take the required number of samples during the measurement period $T_{\text{Measurement Period, GSM}}$ (see section 8.1.2.4.5.2.1).

The event triggered measurement reporting delay for a GSM cell with verified BSIC , measured without L3 filtering shall be less than $2*T_{Measurement\ Period,\ GSM}$, where $T_{Measurement\ Period,\ GSM}$ is defined in section 8.1.2.4.5.2.1. When L3 filtering is used an additional delay can be expected.

8.1.2.4.5.2.5 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.4.5.2.4 Event Triggered Reporting.

8.1.2.4.6 E-UTRAN TDD – GSM measurements

The requirements in section 8.1.2.4.5 also apply for this section.

8.1.2.4.7 E-UTRAN FDD – UTRAN FDD measurements for SON

8.1.2.4.7.1 Identification of a new UTRA FDD cell for SON

No explicit neighbour list is provided to the UE for identifying a UTRA cell for SON. The UE shall identify and report only the strongest cell when requested by the network for the purpose of SON.

8.1.2.4.7.1.1 Requirements when no DRX is used

When no DRX is used the UE shall be able to identify a new cell within:

$$\mathbf{T}_{\text{identify, UTRA_FDD}} = \mathbf{T}_{\text{basic_identify_UTRA_FDD}} \cdot \frac{480}{\text{Tinter1}} \cdot N_{\textit{Freq}} \quad \textit{ms}$$

 $T_{basic_identify_UTRA_FDD} = 300$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA FDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- CPICH Ec/Io \geq -20 dB,
- SCH_Ec/Io ≥ -17 dB for at least one channel tap and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify, \, UTRA_FDD}$ ms, the UE may stop searching UTRA cells for SON.

8.1.2.4.7.1.2 Requirements when DRX is used

When DRX is used the UE shall be able to identify a new cell within $T_{identify,\,UTRA_FDD}$ as defined in table 8.1.2.4.7.1.2-1.

DRX cycle length (s) T_{identify}, UTRA_FDD (s) (DRX cycles) Gap period = 40 ms Gap period = 80 ms Non DRX Requirements Non DRX Requirements ≤0.04 in section in section 8.1.2.4.7.1.1 8.1.2.4.7.1.1are are applicable applicable 0.04<DRX cycle≤0.08 7.6* N_{freq} (95* N_{freq}) 3.6* N_{freq} (45* N_{freq}) 4.0* N_{freq} (25* N_{freq}) 8.0* N_{freq} (50* N_{freq}) 0.08<DRX cycle≤0.16 8.96* N_{freq} (28* N_{freq}) 8* N_{freq} (25* N_{freq}) 0.16<DRX cycle≤0.32 0.32<DRX cycle≤2.56 Note (25* N_{freq}) Note (25* N_{freq}) Note: Time depends upon the DRX cycle in use

Table 8.1.2.4.7.1.2-1: Requirement to identify a new UTRA FDD cell for SON

A cell shall be considered identifiable provided following conditions are fulfilled:

- 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.

If the UE is unable to identify the UTRA cell for SON within $8*T_{identify, UTRA_FDD}$ seconds, the UE may stop searching UTRA cells for SON; $T_{identify, UTRA_FDD}$ is defined in table 8.1.2.4.7.1.2-1.

8.1.2.4.7.1.3 Reporting Delay

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $T_{identify, \, UTRA_FDD}$ defined in section 8.1.2.4.7.1.1 and in section 8.1.2.4.7.1.2 for non DRX and DRX cases respectively. When L3 filtering is used an additional delay can be expected.

8.1.2.4.8 E-UTRAN TDD – UTRAN FDD measurements for SON

The requirements in section 8.1.2.4.7 also apply for this section.

8.1.2.4.9 E-UTRAN FDD – cdma2000 1xRTT measurements

UE shall perform cdma2000 1xRTT measurements according to the procedure defined in [15] on the cdma2000 1xRTT neighbor cells indicated by the serving eNode B. If measurement gaps are required, the UE shall perform cdma2000 1xRTT measurements only during the measurement gaps configured by the serving eNode B.

8.1.2.4.9.1A E-UTRAN FDD – cdma2000 1xRTT measurements when no DRX is used

When measurement gaps are scheduled for CDMA2000 1xRTT inter RAT measurements, the UE physical layer shall be capable of reporting CDMA2000 1xRTT Pilot Strength measurements to higher layers with measurement accuracy as specified in Section 9.5, corresponding to a 90% measurement success rate, with measurement period given by

$$\mathbf{T}_{\text{measurement_CDMA2000_1x}} = \mathbf{T}_{\text{basic_measurement_CDMA2000_1x}} \cdot N_{\textit{Freq}} \cdot S_{\textit{gap}}$$

where $T_{basic_measurement_CDMA2000_1x} = 100$ ms and the measurement gap specific scale factor S_{gap} is based on the measurement gap pattern in use as defined in Table 8.1.2.4.9.1-1. If inter-frequency RSTD measurements are configured as a part of the measurement configuration, S_{gap} shall be based to the Gap Pattern Id 1.

Table 8.1.2.4.9.1-1: Gap Pattern Specific Scale Factor

Gap Pattern Id	S _{gap}
0	32/3
1	64/3

If the UE does not need measurement gaps to perform CDMA2000 1xRTT Pilot Strength measurements, the measurement period is given by

$$\mathbf{T}_{\text{measurement_CDMA2000_1x}} = \mathbf{T}_{\text{basic_measurement_CDMA2000_1x}} \cdot N_{\textit{Freq}} \,.$$

8.1.2.4.9.1 Periodic Reporting

Reported measurements in periodically triggered measurement reports shall meet the requirements in section 9.

The measurement reporting delay of each periodic report is defined as the time between the end of the last measurement period and the moment when the UE starts to transmit the measurement report over the Uu interface. This delay shall be less than T_{71m} defined in [15] for each periodic report. This measurement reporting delay excludes a delay which is caused by the unavailability of the uplink resources for the UE to send the measurement report.

8.1.2.4.10 E-UTRAN TDD – cdma2000 1xRTT measurements

The requirements in section 8.1.2.4.9 also apply for this section.

8.1.2.4.11 E-UTRAN FDD – HRPD measurements

UE shall perform HRPD measurements according to the procedure defined in [11] on the HRPD neighbor cells indicated by the serving eNode B. If measurement gaps are required, the UE shall perform HRPD measurements only during the measurement gaps configured by the serving eNode B.

8.1.2.4.12 E-UTRAN TDD – HRPD measurements

The requirements in section 8.1.2.4.11 also apply for this section.

8.1.2.4.13 E-UTRAN TDD – UTRAN TDD measurements for SON

8.1.2.4.13.1 Identification of a new UTRA TDD cell for SON

No explicit neighbour list is provided to the UE for identifying a UTRA TDD cell for SON. The UE shall identify and report only the strongest cell when requested by the network for the purpose of SON.

8.1.2.4.13.1.1 Requirements when no DRX is used

When no DRX is used the UE shall be able to identify a new cell within:

$$T_{\text{identify, UTRA_TDD}} = T_{\text{basic_identify_UTRA_TDD}} \cdot \frac{480}{T_{\text{interl}}} \cdot N_{\text{Freq}} \quad ms$$

 $T_{basic_identify_UTRA_TDD} = 800$ ms. This is the time period used in the above equation where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

A cell shall be considered identifiable following conditions are fulfilled:

- P-CCPCH Ec/Io \geq -8 dB,
- DwPCH_Ec/Io > -5 dB.

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

If the UE is unable to identify the UTRA TDD cell for SON within $8*T_{identify,\ UTRA_TDD}$ ms, the UE may stop searching UTRA TDD cells for SON.

8.1.2.4.13.1.2 Requirements when DRX is used

When DRX is used the UE shall be able to identify a new cell within $T_{identify,\,UTRA_TDD}$ as defined in table 8.1.2.4.13.1.2-1.

DRX cycle length (s) T_{identify, UTRA_TDD} (s) (DRX cycles) Gap period = 40 ms Gap period = 80 ms ≤0.16 Non DRX Requirements Non DRX Requirements in section 8.1.2.3.1.1 are in section 8.1.2.3.1.1 are applicable applicable 0.16<DRX cycle≤0.32 8* N_{freq} (25* N_{freq}) 12.8* N_{freq} (40* N_{freq}) Note (25* N_{freq}) 0.32<DRX cycle≤2.56 Note (25* N_{freq}) Note: Time depends upon the DRX cycle in use

Table 8.1.2.4.13.1.2-1: Requirement to identify a new UTRA TDD cell for SON

A cell shall be considered identifiable provided following conditions are fulfilled:

- P-CCPCH Ec/Io > -8 dB,
- DwPCH Ec/Io > -5 dB.

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

If the UE is unable to identify the UTRA TDD cell for SON within $8*T_{identify,\ UTRA_TDD}$ seconds, the UE may stop searching UTRA TDD cells for SON; $T_{identify,\ UTRA_TDD}$ is defined in table 8.1.2.4.13.1.2-1.

8.1.2.4.13.1.3 Reporting Delay

The UE shall not report the physical cell identity of an identifiable cell for SON as long as the reporting criteria are not fulfilled.

The reporting delay is defined as the time between the identification of the strongest cell for SON until the UE starts to transmit its physical cell identity over the Uu interface. This requirement assumes that the reporting of the physical cell identity is not delayed by other RRC signalling on the DCCH. This reporting delay excludes a delay uncertainty resulted when inserting the physical cell identity of the strongest cell for SON to the TTI of the uplink DCCH. The delay uncertainty is twice the TTI of the uplink DCCH. This reporting delay excludes any delay caused by unavailability of UL resources for UE sending the physical cell identity of the strongest cell for SON.

The reporting delay of the physical cell identity of the strongest cell for SON without L3 filtering shall be less than $T_{identify,\,UTRA_TDD}$ defined in section 8.1.2.4.13.1.1 and in section 8.1.2.4.13.1.2 for non DRX and DRX cases respectively. When L3 filtering is used an additional delay can be expected.

8.1.2.4.14 E-UTRAN FDD – UTRAN TDD measurements for SON

The requirements in section 8.1.2.4.13 also apply for this section.

8.1.2.5 E-UTRAN OTDOA Intra-Frequency RSTD Measurements

All intra-frequency RSTD measurement requirements specified in Sections 8.1.2.5.1 and 8.1.2.5.2 shall apply without DRX as well as for all the DRX cycles specified in 3GPP TS 36.331 [2].

8.1.2.5.1 E-UTRAN FDD Intra-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure intra-frequency RSTD, specified in 3GPP TS 36.214 [4], for at least n=16 cells, including the reference cell, on the same carrier frequency f1 as that of the reference cell within

 $T_{RSTD\ IntraFreqFDD,\ E-UTRAN}$ ms as given below (see also Figure 8.1.2.5.1-1):

$$T_{RSTD IntraFreqFDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD\ IntraFreqFDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the cell-specific positioning subframe configuration period as defined in 3GPP TS 36.211 [16],

M is the number of PRS positioning occasions as defined in Table 8.1.2.5.1-1, where each PRS positioning occasion comprises of N_{PRS} ($1 \le N_{PRS} \le 6$) consecutive downlink positioning subframes defined in 3GPP TS 36.211 [16], and

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time and the processing time.

Table 8.1.2.5.1-1: Number of PRS positioning occasions within $T_{RSTD\;IntraFreqFDD,\;E-UTRAN}$

Positioning subframe	Number of PRS positioning occasions M	
configuration period $T_{ m PRS}$	f1 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16

Note 1: When only intra-frequency RSTD measurements are performed over cells belonging to the serving FDD carrier frequency f1.

Note 2: When intra-frequency RSTD and inter-frequency RSTD measurements are performed over cells belonging to the serving FDD carrier frequency f1 and one inter-frequency carrier frequency f2, respectively.

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{RSTD IntraFreqFDD, E-UTRAN}$ provided:

 $(PRS \, \hat{E}_s / Iot)_{ref} \ge -6 \, dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_a / Iot) \ge -13 dB$ for all Frequency Bands for neighbour cell i,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning occasions,

PRP $1.2|_{dBm} \ge -127$ dBm for Frequency Bands 1, 4, 6, 10, 11, 18, 19, 21, 24

PRP 1,2|_{dBm}≥ -126 dBm for Frequency Bands 9,

PRP $1.2|_{dBm} \ge -125$ dBm for Frequency Bands 2, 5, 7,

PRP $1.2|_{dBm} \ge -124$ dBm for Frequency Bands 3, 8, 12, 13, 14, 17, 20.

 $PRS \, \hat{E}_s$ / Iot is defined as the ratio of the average received energy per PRS RE during the useful part of the symbol to the average received power spectral density of the total noise and interference for this RE, where the ratio is measured over all REs which carry PRS.

The time $T_{RSTD\,IntraFreqFDD,\,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], is delivered to the physical layer of the UE as illustrated in Figure 8.1.2.5.1-1.

The RSTD measurement accuracy for all measured neighbor cells *i* shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.1.

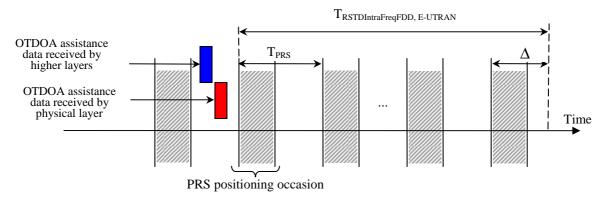


Figure 8.1.2.5.1-1. Illustration of the RSTD reporting time requirement in an FDD system.

8.1.2.5.1.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP 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 any delay caused by no UL resources for UE to send the measurement report.

8.1.2.5.2 E-UTRAN TDD Intra-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure intra-frequency RSTD, specified in 3GPP TS 36.214 [4], for at least n=16 cells, including the reference cell, on the same carrier frequency f1 as that of the reference cell within

 $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ ms as given below:

$$T_{RSTD IntraFreqTDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the cell-specific positioning subframe configuration period as defined in 3GPP TS 36.211 [16],

M is the number of PRS positioning occasions as defined in Table 8.1.2.5.2-1, where a PRS positioning occasion is as defined in Section 8.1.2.5.1, and

 $\Delta = 160 \cdot \left| \frac{n}{M} \right|$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time

and the processing time.

Table 8.1.2.5.2-1: Number of PRS positioning occasions within $T_{RSTD\;IntraFreqTDD,\;E-UTRAN}$

Positioning subframe	Number of PRS positioning occasions M	
configuration period $T_{ m PRS}$	f1 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16

Note 1: When only intra-frequency RSTD measurements are performed over cells belonging to the serving TDD carrier frequency f1.

Note 2: When intra-frequency RSTD and inter-frequency RSTD measurements are performed over cells belonging to the serving TDD carrier frequency f1 and one inter-frequency carrier frequency f2 respectively.

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD IntraFreqTDD. E-UTRAN}}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_s / Iot) \ge -13 dB$ for all Frequency Bands for neighbour cell i,

 $\left(\text{PRS } \hat{\mathbf{E}}_{\text{s}} / \text{Iot} \right)_{\text{ref}}$ and $\left(\text{PRS } \hat{\mathbf{E}}_{\text{s}} / \text{Iot} \right)_{i}$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

PRP $1.2|_{dBm} \ge -127$ dBm for Frequency Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43,

PRP 1,2|_{dBm}≥ -126 dBm for Frequency Band 41.

PRS \hat{E}_s / Iot is as defined in Section 8.1.2.5.1.

The time $T_{RSTD\ IntraFreqTDD,\ E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], is delivered to the physical layer of the UE.

The RSTD measurement accuracy for all measured neighbor cells i shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.1.

The intra-frequency requirements in this section (8.1.2.5.2) shall apply for all TDD special subframe configurations specified in 3GPP TS 36.211 [16] and for the TDD uplink-downlink configurations as specified in Table 8.1.2.5.2-2.

Table 8.1.2.5.2-2: TDD uplink-downlink subframe configurations applicable for TDD intra-frequency requirements

PRS Transmission Bandwidth [RB]	Applicable TDD uplink-downlink configurations	
6, 15	1, 2, 3, 4 and 5	
25, 50, 75, 100	0, 1, 2, 3, 4, 5 and 6	
Note: Uplink-downlink configurations are specified in Table 4.2-2 in 3GPP TS 36.211 [16].		

8.1.2.5.2.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP 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: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6 E-UTRAN Inter-Frequency OTDOA Measurements

All inter-frequency RSTD measurement requirements specified in Sections 8.1.2.6.1-8.1.2.6.4 shall apply when the measurement gap pattern ID # 0 specified in Section 8.1.2.1 is used.

All inter-frequency RSTD measurement requirements specified in Sections 8.1.2.6.1-8.1.2.6.4 shall apply without DRX as well as for all the DRX cycles specified in 3GPP TS 36.331 [2].

8.1.2.6.1 E-UTRAN FDD-FDD Inter-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in 3GPP TS 36.214 [4], for at least n=16 cells, including the reference cell, within $T_{RSTD \, InterFreqFDD, \, E-UTRAN}$ ms as given below:

$$T_{RSTD InterFreqFDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD\ InterFredFDD.\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the the largest value of the cell-specific positioning subframe configuration period, defined in 3GPP TS 36.211 [16], among the measured n cells including the reference cell,

M is the number of PRS positioning occasions as defined in Table 8.1.2.6.1-1, where a PRS positioning occasion is as defined in Section 8.1.2.5.1, and

 $\Delta = 160 \cdot \left\lceil \frac{n}{M} \right\rceil$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time and the processing time.

Table 8.1.2.6.1-1: Number of PRS positioning occasions within $T_{RSTD\;InterFreqFDD,\;E-UTRAN}$

Positioning subframe	Number of PRS positioning occasions M	
configuration period $T_{ m PRS}$	f2 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16

Note 1: When inter-frequency RSTD measurements are performed over the reference cell and neighbour cells, which belong to the FDD inter-frequency carrier frequency f2.

Note 2: When inter-frequency RSTD measurements are performed over the reference cell and the neighbour cells, which belong to the serving FDD carrier frequency f1 and the FDD inter-frequency carrier frequency f2 respectively.

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{\text{RSTD InterFreqFDD, E-UTRAN}}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_a / Iot)_i \ge -13 dB$ for all Frequency Bands for neighbour cell i,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning

occasions,

PRP $1,2|_{dBm} \ge -127$ dBm for Frequency Bands 1, 4, 6, 10, 11, 18, 19, 21, 24

PRP $1.2|_{dBm} \ge -126 dBm$ for Frequency Bands 9,

PRP $1,2|_{dBm} \ge -125$ dBm for Frequency Bands 2, 5, 7,

PRP $1.2|_{dBm} \ge -124$ dBm for Frequency Bands 3, 8, 12, 13, 14, 17, 20.

PRS \hat{E}_s / Iot is as defined in Section 8.1.2.5.1.

The time $T_{RSTD\ InterFreqFDD,\ E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], is delivered to the physical layer of the UE.

The RSTD measurement accuracy for all measured neighbor cells *i* shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.2.

8.1.2.6.1.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP 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: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6.2 E-UTRAN TDD-FDD Inter-Frequency OTDOA Measurements

The requirements in section 8.1.2.6.1 also apply for this section, assuming f1 is a TDD frequency and f2 is an FDD frequency.

8.1.2.6.3 E-UTRAN TDD-TDD Inter-Frequency OTDOA Measurements

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in 3GPP TS 36.214 [4], for at least n=16 cells, including the reference cell, within $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$ ms as given below:

$$T_{RSTD InterFreqTDD, E-UTRAN} = T_{PRS} \cdot (M-1) + \Delta$$
 ms

where

 $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$ is the total time for detecting and measuring at least n cells,

 $T_{\rm PRS}$ is the largest value of the cell-specific positioning subframe configuration period, defined in 3GPP TS 36.211 [16], among the measured n cells including the reference cell,

M is the number of PRS positioning occasions as defined in Table 8.1.2.6.1-1, where a PRS positioning occasion is as defined in Section 8.1.2.5.1, and

 $\Delta = 160 \cdot \left| \frac{n}{M} \right|$ ms is the measurement time for a single PRS positioning occasion which includes the sampling time and the processing time.

Table 8.1.2.6.3-1: Number of PRS positioning occasions within $T_{RSTD\ InterFreqTDD,\ E-UTRAN}$

Positioning subframe	Number of the positionin	
configuration period $T_{ m PRS}$	f2 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16

Note 1: When inter-frequency RSTD measurements are performed over the reference cell and neighbour cells, which belong to the TDD inter-frequency carrier frequency f2.

Note 2: When inter-frequency RSTD measurements are performed over the reference cell and the neighbour cells, which belong to the serving TDD carrier frequency f1 and the TDD inter-frequency carrier frequency f2 respectively.

The inter-frequency requirements in this section (8.1.2.6.3) shall apply for all TDD special subframe configurations specified in 3GPP TS 36.211 [16] and for the TDD uplink-downlink configurations as specified in Table 8.1.2.6.3-2.

Table 8.1.2.6.3-2: TDD uplink-downlink subframe configurations applicable for inter-frequency requirements

PRS Transmission Bandwidth [RB]	Applicable TDD uplink-downlink configurations	
6, 15	3, 4 and 5	
25	1, 2, 3, 4, 5 and 6	
50, 75, 100 0, 1, 2, 3, 4, 5 and 6		
Note: Uplink-downlink configurations are specified in Table 4.2-2 in 3GPP TS 36.211 [16].		

The UE physical layer shall be capable of reporting RSTD for the reference cell and all the neighbor cells i out of at least (n-1) neighbor cells within $T_{RSTD InterFreqTDD, E-UTRAN}$ provided:

 $(PRS \hat{E}_s / Iot)_{ref} \ge -6 dB$ for all Frequency Bands for the reference cell,

 $(PRS \hat{E}_s / Iot)_i \ge 13 \text{ dB for all Frequency Bands for neighbour cell } i$,

 $(PRS \hat{E}_s / Iot)_{ref}$ and $(PRS \hat{E}_s / Iot)_i$ conditions apply for all subframes of at least $L = \frac{M}{2}$ PRS positioning occasions,

PRP $1.2|_{dBm} \ge -127$ dBm for Frequency Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43,

PRP $1,2|_{dBm} \ge -126$ dBm for Frequency Band 41.

PRS \hat{E}_s / Iot is as defined in Section 8.1.2.5.1.

The time $T_{RSTD\,InterFreqTDD,\,E-UTRAN}$ starts from the first subframe of the PRS positioning occasion closest in time after the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], is delivered to the physical layer of the UE.

The RSTD measurement accuracy for all measured neighbor cells i shall be fulfilled according to the accuracy as specified in the sub-clause 9.1.10.2.

8.1.2.6.3.1 RSTD Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other LPP 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: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

8.1.2.6.4 E-UTRAN FDD-TDD Inter-Frequency OTDOA Measurements

The requirements in section 8.1.2.6.3 also apply for this section, assuming f1 is an FDD frequency and f2 is a TDD frequency.

8.1.2.7 E-UTRAN E-CID Measurements

8.1.2.7.1 E-UTRAN FDD UE Rx-Tx Time Difference Measurements

When no DRX is used the physical layer measurement period of the UE Rx-Tx time difference measurement shall be 200 ms.

When DRX is used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_FDD_UE_Rx_Tx}$) of the UE Rx-Tx time difference measurement shall be as specified in table 8.1.2.7.1-1.

Table 8.1.2.7.1-1: FDD UE Rx-Tx time difference measurement requirement when DRX is used

DRX cycle length (s)	T _{measure_FDD_UE_Rx_Tx} (s) (DRX cycles)	
≤0.04	0.2 (Note1)	
0.04 <drx-cycle≤2.56< td=""><td>Note2 (5)</td></drx-cycle≤2.56<>	Note2 (5)	
Note1: Number of DRX cycle depends upon the DRX cycle in use		
Note2: Time depends upon the DRX cycle in use		

The measurement accuracy for the UE Rx-Tx time difference measurement when DRX is used as well as when no DRX is used shall be as specified in the sub-clause 9.1.9.

8.1.2.7.1.1 UE Rx-Tx Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other RRC or LPP 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 any delay caused by no UL resources for UE to send the measurement report.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in subclause 9.1.9.

8.1.2.7.2 E-UTRAN TDD UE Rx-Tx Time Difference Measurements

When no DRX is used the physical layer measurement period of the UE Rx-Tx time difference measurement shall be 200 ms.

When DRX is used in RRC_CONNECTED state the physical layer measurement period ($T_{measure_TDD_UE_Rx_Tx}$) of the UE Rx-Tx time difference measurement shall be as specified in table 8.1.2.7.2-1.

Table 8.1.2.7.2-1: TDD UE Rx-Tx time difference measurement requirement when DRX is used

DRX cycle length (s)	T _{measure_TDD_UE_Rx_Tx} (s) (DRX cycles)				
≤0.04	0.2 (Note1)				
0.04 <drx-cycle≤2.56< td=""><td>Note2 (5)</td></drx-cycle≤2.56<>	Note2 (5)				
Note1: Number of DRX cycle depends upon the DRX cycle in use					
Note2: Time depends upon the DRX cycle in use					

The measurement accuracy for the UE Rx-Tx time difference measurement when DRX is used as well as when no DRX is used shall be as specified in the sub-clause 9.1.9.

8.1.2.7.2.1 UE Rx-Tx Measurement Reporting Delay

This requirement assumes that that the measurement report is not delayed by other RRC or LPP 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: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in subclause 9.1.9.

8.2 Capabilities for Support of Event Triggering and Reporting Criteria

8.2.1 Introduction

This section contains requirements on UE capabilities for support of event triggering and reporting criteria. As long as the measurement configuration does not exceed the requirements stated in section 8.2.2, the UE shall meet the performance requirements defined in section 9.

The UE can be requested to make measurements under different measurement identities defined in 3GPP TS 36.331 [2]. Each measurement identity corresponds to either event based reporting, periodic reporting or no reporting. In case of event based reporting, each measurement identity is associated with an event. In case of periodic reporting, a measurement identity is associated with one periodic reporting criterion. In case of no reporting, a measurement identity is associated with one no reporting criterion.

The purpose of this section is to set some limits on the number of different event, periodic and no reporting criteria the UE may be requested to track in parallel.

8.2.2 Requirements

In this section a reporting criterion corresponds to either one event (in the case of event based reporting), or one periodic reporting criterion (in case of periodic reporting), or one no reporting criterion (in case of no reporting). For event based reporting, each instance of event, with the same or different event identities, is counted as separate reporting criterion in table 8.2.2-1.

The UE shall be able to support in parallel per category up to E_{cat} reporting criteria according to table 8.2.2-1. If the UE is not configured with SCell carrier frequencies, for the measurement categories belonging to measurements on: E-UTRA intra-frequency cells, E-UTRA inter-frequency cells, and inter-RAT per supported RAT, the UE need not support more than 25 reporting criteria in total. If the UE is configured with SCell carrier frequencies, for the measurement categories belonging to measurements on: E-UTRA intra-frequency cells, E-UTRA inter frequency cells, and inter-RAT per supported RAT, the UE need not support more than $\underline{30}$ reporting criteria in total.

Table 8.2.2-1: Requirements for reporting criteria per measurement category

Measurement category	E _{cat}	Note
Intra-frequency	9	E-UTRA intra-frequency cells
Intra-frequency UE Rx-Tx time difference	2	Intra-frequency UE Rx-Tx time difference measurements reported to E-UTRAN via RRC and to positioning server via LPP. Applies for UE supporting both LPP and UE Rx-Tx time difference measurement.
Intra-frequency RSTD	1	Intra-frequency RSTD measurement reporting for UE supporting OTDOA; 1 report capable of minimum 16 cell measurements for the intra-frequency
Inter-frequency	7	E-UTRA inter-frequency cells
Inter-frequency RSTD	1	Inter-frequency RSTD measurement reporting for UE supporting OTDOA; 1 report capable of minimum 16 cell measurements for at least one inter-frequency
Inter-RAT (E-UTRAN FDD or TDD, UTRAN FDD, UTRAN TDD, GSM, cdma2000 1 x RTT and HRPD)	5	Only applicable for UE with this (inter-RAT) capability. This requirement (E _{cat} = 5) is per supported RAT.
Note: When the UE is configured with SCell carrifrequency.	er frequenci	ies, E _{cat} for Intra-frequency is applied per serving

8.3 Measurements for E-UTRA carrier aggregation

8.3.1 Introduction

This section contains requirements on UE capabilities for support of E-UTRA carrier aggregation. Requirements in this section are applicable to all carrier aggregation capable UE which have been configured with one downlink Scell. Non configured frequencies may be measured with measurement gaps according to the requirements in section 8.1.2.3 (E-UTRAN inter frequency measurements). Requirements in this section are applicable to both FDD and TDD carrier aggregation.

8.3.2 Measurements of the primary component carrier

Meaurements of cells on the primary component carrier shall meet all applicable requirements (FDD or TDD) in section 8.1.2.2 (E-UTRAN intra frequency measurements)

8.3.3 Measurements of the secondary component carrier

The Secondary component carrier may be activated and deactivated by MAC-CE commands as specified in [17]. The applicable performance requirements depend on whether the Scell on the corresponding frequency is actived or deactivated.

8.3.3.1 Measurements of the secondary component carrier with active SCell

When the SCell is activated, measurement performance requirements for the frequency are those given in section 8.1.2.2(E-UTRAN intra frequency measurements). If common DRX is in use, then the requirements for the secondary component carrier are given by the applicable DRX requirements (FDD or TDD) in section 8.1.2.2, otherwise the non DRX requirements are applicable. The applicable measurement accuracy requirements are in section 9.1.11 (Carrier aggregation measurement accuracy)

8.3.3.2 Measurements of the secondary component carrier with deactivated SCell

8.3.3.2.1 E-UTRAN secondary component carrier measurements when no common DRX is used

When no DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify_scc}$, according to the parameter scellMeasCycle where $T_{identify_scc} = 20$ scellMeasCycle

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,
- SCH_RP|_{dBm} \geq -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 and SCH Ês/Iot > 6 dB.
- SCH_RP $|_{dBm} \ge -126 dBm$ for Band 9 and SCH $\hat{E}s/Iot > -6 dB$,
- SCH_RP $|_{dBm} \ge -125$ dBm for Bands 2, 5, 7 and SCH \hat{E} s/Iot ≥ -6 dB,
- SCH_RP $|_{dBm} \ge -124 \text{ dBm}$ for Bands 3, 8, 12, 13, 14, 17, 20 and SCH $\hat{E}s/Iot \ge -6 \text{ dB}$.

The measurement period for deactivated scell measurements is $T_{measure_scc}$ according to the parameter measurement scellMeasCycle where $T_{measure_scc} = 5$ scellMeasCycle. The UE shall be capable of performing RSRP measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_scc}$.

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 (Carrier aggregation measurement accuracy)

8.3.3.2.1.1 Measurement Reporting Requirements

8.3.3.2.1.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.3.3.2.1.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.3.3.2.1.1.3 Event Triggered Reporting.

8.3.3.2.1.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is 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 $T_{identify_scc}$ defined in Section 8.3.3.2.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_scc}$ defined in section 8.3.3.2.1 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than $T_{measure_scc}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

8.3.3.2.2 E-UTRAN secondary component carrier measurements when common DRX is used

When DRX is in use the UE shall be able to identify a new detectable FDD or TDD cell on the secondary component carrier within $T_{identify_scc}$, according to the parameter scellMeasCycle where $T_{identify_scc} = max(20 \ scellMeasCycle$, $T_{identify_scc1}$). $T_{identify_scc1}$ is given in table 8.3.3.2.2-1.

Table 8.3.3.2.2-1: Requirement for Tidentify scc1

DRX		T _{identify_scc1} (s) (DRX		
lengt	h (s)	cycles)		
≤0.	04	0.8 (Note1)		
0.04<	DRX-	Note2 (40)		
cycles	≤0.08			
>80.0	DRX-	Note2(20)		
cycles	≤2.56			
Note1:	Number of DRX cycle depend			
	upon the DRX cycle in use			
Note2:	Time depends upon the DRX			

cycle in use

A cell shall be considered detectable when

- RSRP related side condition given in Section 9.1 are fulfilled for a corresponding Band,

- SCH_RP| $_{dBm} \ge$ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21,24, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 and SCH £s/Iot \ge 6 dB.
- SCH_RP $|_{dBm} \ge -126 dBm$ for Band 9 and SCH Ês/Iot $\ge -6 dB$,
- SCH_RP $|_{dBm} \ge -125 \text{ dBm}$ for Bands 2, 5, 7 and SCH Ês/Iot > -6 dB,
- SCH RP $|_{dBm} \ge -124$ dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH \hat{E} s/Iot > 6 dB.

cycle in use

The measurement period for deactivated scell measurements is $T_{measure_scc}$ according to the parameter *scellMeasCycle* where $T_{measure_scc} = max(5 \ scellMeasCycle, T_{measure_scc})$. The UE shall be capable of performing RSRP measurements for 8 identified cells on the secondary component carrier, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of $T_{measure_scc}$. $T_{measure_scc}$ is given in table 8.3.2.2-2

Table 8.3.3.2.2-2: Requirement for T_{measure_scc1}

DRX cycle length (s)	T _{measure_scc1} (s) (DRX cycles)			
≤0.04	0.2 (Note1)			
0.04 <drx-< td=""><td>Note2 (5)</td></drx-<>	Note2 (5)			
cycle≤2.56				
Note1: Number of DRX cycle				
depends upon the DRX cycle in use				
Note2: Time de	pends upon the DRX			

The measurement accuracy for all measured cells shall be as specified in the sub-clause 9.1.11 (Carrier aggregation measurement accuracy).

8.3.3.2.2.1 Measurement Reporting Requirements

8.3.3.2.2.1.1 Periodic Reporting

Reported measurements contained in periodically triggered measurement reports shall meet the requirements in section 9.

8.3.3.2.2.1.2 Event-triggered Periodic Reporting

Reported measurements contained in event triggered periodic measurement reports shall meet the requirements in section 9.

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.3.3.2.2.1.3 Event Triggered Reporting.

8.3.3.2.2.1.3 Event Triggered Reporting

Reported measurements contained in event triggered measurement reports shall meet the requirements in section 9.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: $2 \times TTI_{DCCH}$. This measurement reporting delay excludes a delay which is 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 $T_{identify_scc}$ defined in Section 8.3.3.2.2. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period $T_{identify_scc}$ defined in section 8.3.3.2.2 becomes undetectable for a period ≤ 5 seconds and then the cell becomes detectable again and triggers an event, the event

triggered measurement reporting delay shall be less than $T_{measure_scc}$ provided the timing to that cell has not changed more than \pm 50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

9 Measurements performance requirements for UE

One of the key services provided by the physical layer is the measurements used to trigger or perform a multitude of functions. Both the UE and the E-UTRAN are required to perform measurements. The physical layer measurement model and a complete list of measurements are specified in [25] and [22] respectively. The physical layer measurements are described and defined in [4]. In this clause for each measurement the relevant requirements on the measurement period, reporting range, granularity and performance in terms of accuracy are specified.

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. Definitions of each frequency bands can be found in [5].

The accuracy requirements in this clause are applicable for AWGN radio propagation conditions and assume independent interference (noise) at each receiver antenna port.

9.1 E-UTRAN measurements

9.1.1 Introduction

The requirements in this clause are applicable for a UE:

- in state RRC_CONNECTED
- performing measurements with appropriate measurement gaps as defined in Section 8.1.2.1.
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in [25].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the higher layer filtering disabled.

9.1.2 Intra-frequency RSRP Accuracy Requirements

9.1.2.1 Absolute RSRP Accuracy

The requirements for absolute accuracy of RSRP in this section apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.2.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

RSRP|dBm≥ -126 dBm for Bands 9, 41,

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

 $RSRP_{dBm} \ge -124 \text{ dBm for Bands } 3, 8, 12, 13, 14, 17, 20.$

Table 9.1.2.1-1: RSRP Intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions ¹			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				lo	lo	lo	lo
RSRP for Ês/lot ≥	dBm	±6	±9	-	-	-	-
-6 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				70dBm/	70dBm/	70dBm/	70dBm/
				BW Channel	BW Channel	BW _{Channel}	BW Channel
RSRP for Ês/lot ≥	dBm	±8	±11	-70dBm/	-70dBm/	-70dBm/	-70dBm/
-6 dB				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
				50dBm/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
Note 1. lo is assur	ned to h	ave constant E	PRE across	the bandwidth.			

9.1.2.2 Relative Accuracy of RSRP

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 9.1.2.2-1 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.

 $RSRP1,2|_{dBm} \ge -127 \text{ dBm for Bands } 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43$

RSRP1,2 $|_{dBm} \ge -126 \text{ dBm for Bands 9, 41,}$

RSRP1,2 $|_{dBm} \ge -125$ dBm for Bands 2, 5, 7,

 $RSRP1,2|_{dBm} \ge -124 \ dBm \ for \ Bands \ 3, \ 8, \ 12, \ 13, \ 14, \ 17, \ 20.$

Table 9.1.2.2-1: RSRP Intra frequency relative accuracy

Parameter	Unit	Accura	cy [dB]	Conditions ¹			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				lo	lo	lo	lo
RSRP for Ês/lot	dBm	±2	±3	-	-	-	-
> -3 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				BW Channel	BW Channel	BW Channel	BW _{Channel}
RSRP for Ês/lot ≥	dBm	±3	±3	-	-	-	-
-6 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}

Note 1. Io is assumed to have constant EPRE across the bandwidth.

Note 2. The parameter Ês/lot is the minimum Ês/lot of the pair of cells.to which the requirement applies.

9.1.3 Inter-frequency RSRP Accuracy Requirements

9.1.3.1 Absolute RSRP Accuracy

The requirements for absolute accuracy of RSRP in this section apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.3.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

RSRP|dBm≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

RSRP|dBm≥ -126 dBm for Bands 9, 41,

RSRP|dBm≥ -125 dBm for Bands 2, 5, 7,

RSRP|dBm≥ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20.

Table 9.1.3.1-1: RSRP Inter frequency absolute accuracy

		Accuracy [dB]		Conditions ¹		
	Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
			lo	lo	lo	lo
Bm	±6	±9	-	-	-	-
			121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
			70dBm/	70dBm/	70dBm/	70dBm/
			BW _{Channel}	BW Channel	BW Channel	BW Channel
Bm	±8	±11	-70dBm/	-70dBm/	-70dBm/	-70dBm/
			BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
			50dBm/	50dBm/	50dBm/	50dBm/
			BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
E	3m	3m ±6 3m ±8	3m ±6 ±9 3m ±8 ±11	21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 Bm ±6 ±9 - 121dBm/15kHz70dBm/ BW_Channel Bm ±8 ±11 -70dBm/ BW_Channel 50dBm/	21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 Io Io Io	21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 O IO IO

9.1.3.2 Relative Accuracy of RSRP

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 9.1.3.2-1 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.

 $RSRP1|_{dBm} \ge -127 \text{ dBm if RSRP1 is on Bands } 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43$

 $RSRP1|_{dBm} \ge -126 dBm if RSRP1 is on Bands 9, 41$

 $RSRP1_{dBm} \ge -125 \text{ dBm if RSRP1 is on Bands 2, 5, 7,}$

 $RSRP1|_{dRm} \ge -124 \text{ dBm if RSRP1 is on Bands 3, 8, 12, 13, 14, 17, 20,}$

 $RSRP2|_{dBm} \ge -127 \text{ dBm if RSRP2 is on Bands } 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43$

 $RSRP2|_{dBm} \ge -126 dBm if RSRP2 is on Bands 9, 41,$

 $RSRP2|_{dBm} \ge -125 dBm \text{ if RSRP2 is on Bands } 2, 5, 7,$

 $RSRP2|_{dBm} \ge -124 \ dBm \ if \ RSRP2 \ is \ on \ Bands \ 3, \ 8, \ 12, \ 13, \ 14, \ 17, \ 20.$

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

| Channel 1_Io -Channel 2_Io | \leq 20 dB

Table 9.1.3.2-1: RSRP Inter frequency relative accuracy

Parameter	Unit	Accura	cy [dB]	Conditions ¹			
		Normal	Extreme	RSRP is on	RSRP is on	RSRP is on	RSRP is on
		condition	condition	Bands 1, 4, 6,	Bands 2, 5, 7	Bands 3, 8, 12,	Bands 9, 41
				10, 11, 18, 19,		13, 14, 17, 20	•
				21, 24, 33, 34,			
				35, 36, 37, 38,			
				39, 40, 42, 43			
				lo	lo	lo	lo
RSRP for Ês/lot	dBm			-121dBm/15kHz	-119dBm/15kHz	-118dBm/15kHz	-120dBm/15kHz
> -6dB		±6	±6	50dBm/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}

Note 1. Io is assumed to have constant EPRE across the bandwidth.

Note 2. The parameter Ês/lot is the minimum Ês/lot of the pair of cells.to which the requirement applies.

9.1.4 RSRP Measurement Report Mapping

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 9.1.4-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.4-1: 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

9.1.5 Intra-frequency RSRQ Accuracy Requirements

9.1.5.1 Absolute RSRQ Accuracy

The requirements for absolute accuracy of RSRQ in this section apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 9.1.5.1-1 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.

 $RSRP|dBm \ge -127 dBm$ for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

RSRP|dBm≥ -126 dBm for Bands 9, 41,

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

 $RSRP|_{dBm} \ge -124 \ dBm$ for Bands 3, 8, 12, 13, 14, 17, 20.

Unit Conditions¹ **Parameter** Accuracy [dB] Bands 9, 41 Normal Extreme Bands 2, 5, 7 Bands 3, 8, 12, Bands 1, 4, 6, 10, 11, 18, 19, condition condition 13, 14, 17, 20 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 lo lo lo lo RSRQ when RSRP dBm ± 2.5 ± 4 \hat{E} s/lot > -3 dB 121dBm/15kHz 119dBm/15kHz 118dBm/15kHz 120dBm/15kHz ... -50dBm/ ... -50dBm/ ... -50dBm/ ... -50dBm/ BW_{Channel} **BW**Channel **BW**Channel **BW**Channel RSRQ when RSRP dBm ± 3.5 ± 4 Ês/lot ≥ -6 dB 121dBm/15kHz 119dBm/15kHz 118dBm/15kHz 120dBm/15kHz ... -50dBm/ ... -50dBm/ ... -50dBm/ ... -50dBm/ **BW**Channel **BW**Channel **BW**Channel **BW**Channel

Table 9.1.5.1-1: RSRQ Intra frequency absolute accuracy

9.1.6 Inter-frequency RSRQ Accuracy Requirements

9.1.6.1 Absolute RSRQ Accuracy

Note 1. Io is assumed to have constant EPRE across the bandwidth.

The requirements for absolute accuracy of RSRQ in this section apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 9.1.6.1-1 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.

 $RSRP|dBm \ge -127 dBm$ for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

RSRP|dBm≥ -126 dBm for Bands 9, 41,

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

 $RSRP|_{dBm} \ge -124 \ dBm$ for Bands 3, 8, 12, 13, 14, 17, 20.

Table 9.1.6.1-1: RSRQ Inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions ¹			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38,	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				39, 40, 42, 43			
				lo	lo	lo	lo
RSRQ when RSRP	dBm	± 2.5	± 4	-	-	-	-
Ês/lot > -3 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
RSRQ when RSRP	dBm	± 3.5	± 4	-	-	-	-
Ês/lot ≥ -6 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
Note 1. lo is assumed	d to have	constant EF	RE across t	he bandwidth.			

9.1.6.2 Relative Accuracy of RSRQ

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 9.1.6.2-1 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 Band 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

 $RSRP1|_{dBm} \ge -126 dBm if RSRP1 is on Bands 9, 41,$

 $RSRP1_{dBm} \ge -125 \text{ dBm if RSRP1 is on Bands } 2, 5, 7,$

 $RSRP1_{dBm} \ge -124 \text{ dBm if RSRP1 is on Bands 3, 8, 12, 13, 14, 17, 20,}$

 $RSRP2|_{dBm} \ge -127 \text{ dBm if RSRP2}$ is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

 $RSRP2|_{dBm} \ge -126 dBm if RSRP2 is on Bands 9, 41,$

 $RSRP2|_{dBm} \ge -125 dBm if RSRP2 is on Bands 2, 5, 7,$

 $RSRP2|_{dBm} \ge -124 \text{ dBm if RSRP2 is on Bands } 3, 8, 12, 13, 14, 17, 20.$

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

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

Table 9.1.6.2-1: RSRQ Inter frequency relative accuracy

Parameter	Unit	Accuracy [dB] Conditions ¹					
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	RSRQ is on Bands 2, 5, 7	RSRQ is on Bands 3, 8, 12, 13, 14, 17, 20	RSRQ is on Bands 9, 41
				lo	lo		
RSRQ when RSRP	dBm	± 3	± 4	-	-	-	-
Ês/lot > -3 dB				121dBm/15kH	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				z50dBm]/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}
RSRQ when RSRP	dBm	± 4	± 4	-	-	-	-
Ês/lot ≥ -6 dB				121dBm/15kH	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				z50dBm]/	50dBm/	50dBm/	50dBm/
				BW _{Channel}	BW _{Channel}	BW _{Channel}	BW _{Channel}

Note 1. Io is assumed to have constant EPRE across the bandwidth.

Note 2. The parameter Es/lot is the minimum Es/lot of the pair of cells.to which the requirement applies.

9.1.7 RSRQ Measurement Report Mapping

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 9.1.7-1. The range in the signalling may be larger than the guaranteed accuracy range.

Table 9.1.7-1: RSRQ 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

9.1.8 Power Headroom

The power headroom (PH), expressed in dB, is defined as the difference between the configured maximum UE output power (P_{CMAX}), which is defined in section 6.2.5 in TS 36.101 [5] and the estimated power for PUSCH transmission according to section 5.1.1.1 in TS 36.213 [3].

9.1.8.1 Period

The reported power headroom shall be estimated over 1 subframe. The power headroom shall be estimated only in a subframe where PUSCH is transmitted.

9.1.8.2 Reporting Delay

The power headroom reporting delay is defined as the time between the beginning of the power headroom reference period and the time when the UE starts transmitting the power headroom over the radio interface. The reporting delay of the power headroom shall be 0 ms, which is applicable for all configured triggering mechanisms for power headroom reporting.

9.1.8.3 Void

9.1.8.4 Report Mapping

The power headroom reporting range is from -23 ...+40 dB. Table 9.1.8.4-1 defines the report mapping.

Table 9.1.8.4-1: Power headroom report mapping

Reported value	Measured quantity value (dB)
POWER_HEADROOM_0	-23 ≤ PH < -22
POWER_HEADROOM_1	-22 ≤ PH < -21
POWER_HEADROOM_2	-21 ≤ PH < -20
POWER_HEADROOM_3	-20 ≤ PH < -19
POWER_HEADROOM_4	-19 ≤ PH < -18
POWER_HEADROOM_5	-18 ≤ PH < -17
POWER_HEADROOM_57	34 ≤ PH < 35
POWER_HEADROOM_58	35 ≤ PH < 36
POWER_HEADROOM_59	36 ≤ PH < 37
POWER_HEADROOM_60	37 ≤ PH < 38
POWER_HEADROOM_61	38 ≤ PH < 39
POWER_HEADROOM_62	39 ≤ PH < 40
POWER HEADROOM 63	PH ≥ 40

9.1.9 UE Rx – Tx time difference

9.1.9.1 Measurement Requirement

NOTE: This measurement is used for UE positioning purposes.

The UE RX-TX time difference is measured from the serving cell.

The accuracy requirements in Table 9.1.9.1-1 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.

No changes to the uplink transmission timing are applied during the measurement period.

 $RSRP|_{dBm} \ge -127 \text{ dBm for Bands } 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43$

 $RSRP|_{dBm} \ge -126 \text{ dBm for Bands } 9, 41,$

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

 $RSRP|_{dBm} \ge -124 \ dBm$ for Bands 3, 8, 12, 13, 14, 17, 20.

Table 9.1.9.1-1: UE Rx - Tx time difference measurement accuracy

Parameter	Downlink Bandwidth	Unit	Accuracy [Ts]	Conditions			
	[MHz]			Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9, 41
				lo	lo	lo	lo
UE RX-TX time difference	≤3 MHz	T_s	± 20	-121dBm /15kHz 	-119dBm /15kHz 	-118dBm /15kHz 	-120dBm /15kHz
for Ês/lot ≥ -3dB	≥ 5 MHz		± 10	-50dBm/ BW _{Channel}	-50dBm/ BW _{Channel}	-50dBm/ BW _{Channel}	-50dBm/ BW _{Channel}

Note 1: Io is assumed to have constant EPRE across the bandwidth

Note 2: Ts is the basic timing unit defined in TS 36.211.

9.1.9.2 Measurement Report mapping

The reporting range of UE Rx - Tx time difference is defined from 0 to $20472T_s$ with $2T_s$ resolution for UE Rx - Tx time difference less than $4096T_s$ and 8Ts for UE Rx - Tx time difference equal to or greater than $4096T_s$.

The mapping of measured quantity is defined in Table 9.1.9.2-1.

Table 9.1.9.2-1: UE Rx - Tx time difference measurement report mapping

Reported value	Measured quantity value	Unit
RX-TX_TIME_DIFFERENCE_0000	$T_{UE\ Rx-Tx} < 2$	Ts
RX-TX_TIME_DIFFERENCE_0001	$2 \le T_{UE Rx-Tx} < 4$	T _s
RX-TX_TIME_DIFFERENCE_0002	$4 \le T_{UE Rx-Tx} < 6$	T _s
RX-TX_TIME_DIFFERENCE_2046	$4092 \le T_{UE Rx-Tx} < 4094$	T _s
RX-TX_TIME_DIFFERENCE_2047	$4094 \le T_{UE Rx-Tx} < 4096$	T _s
RX-TX_TIME_DIFFERENCE_2048	$4096 \le T_{UE Rx-Tx} < 4104$	T _s
RX-TX_TIME_DIFFERENCE_2049	$4104 \le T_{UE Rx-Tx} < 4112$	T _s
RX-TX_TIME_DIFFERENCE_4093	$20456 \le T_{UE Rx-Tx} < 20464$	Ts
RX-TX_TIME_DIFFERENCE_4094	$20464 \le T_{UE Rx-Tx} < 20472$	T _s
RX-TX_TIME_DIFFERENCE_4095	$20472 \le T_{UE\ Rx-Tx}$	T _s

9.1.10 Reference Signal Time Difference (RSTD)

NOTE: This measurement is used for UE positioning purposes.

9.1.10.1 Intra-Frequency Accuracy Requirement

The accuracy requirements in Table 9.1.10.1-1 shall apply without DRX as well as for all the DRX cycles specified in 3GPP TS 36.331 [2].

The accuracy requirements in Table 9.1.10.1-1 are valid under the following conditions:

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

PRP $1,2|_{dBm} \ge -127$ dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

PRP $1.2|_{dBm} \ge -126 \text{ dBm for Bands } 9, 41,$

PRP $1,2|_{dBm} \ge -125 \text{ dBm for Bands } 2, 5, 7,$

PRP $1.2|_{dBm} \ge -124$ dBm for Bands 3, 8, 12, 13, 14, 17, 20.

There are no measurement gaps overlapping with the PRS subframes of the measured cell.

The parameter expected RSTD Uncertainty signalled over LPP by E-SMLC as defined in 3GPP TS 36.355 [24] is less than $5 \mu s$.

BW_{Channel}

≥ -13dB

PRS Unit Conditions Parameter Number Accuracy **Transmission** of Bands Bands Bands Bands [Ts] **Bandwidth Subframes** 1, 4, 6, 2, 5, 7 3, 8, 12, 9, 41 Available for [RB] 10, 11, 13, 14, Measurements 18, 19, 17, 20 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 lo lo lo lo -118dBm -120dBm RSTD for -119dBm 6, 15 6 T_s ± 15 -121dBm /15kHz /15kHz /15kHz /15kHz (PRS Ês/Iot)ref ≥ -6dB and -50dBm/ -50dBm/ -50dBm/ -50dBm/ (PRS Ês/Iot)i 25 ≥2 ± 6 $\mathsf{BW}_\mathsf{Channel}$ $\mathsf{BW}_\mathsf{Channel}$ $\mathsf{BW}_\mathsf{Channel}$

± 5

Table 9.1.10.1-1: RSTD measurement accuracy

Note 1: lo is assumed to have constant EPRE across the bandwidth.

≥1

50, 75, 100

9.1.10.2 Inter-Frequency Accuracy Requirement

The accuracy requirements in Table 9.1.10.2-1 shall apply without DRX as well as for all the DRX cycles specified in 3GPP TS 36.331 [2].

The accuracy requirements in Table 9.1.10.2-1 are valid under the following conditions:

Conditions defined in 36.101 Section 7.3 for reference sensitivity are fulfilled.

PRP $1,2|_{dBm} \ge -127 \text{ dBm}$ for Bands 1, 4, 6, 10, 11, 18, 19, 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43

PRP $1.2|_{dBm} \ge -126 \text{ dBm for Bands } 9, 41,$

PRP $1,2|_{dBm} \ge -125 \text{ dBm for Bands } 2, 5, 7,$

PRP $1.2|_{dBm} \ge -124 \text{ dBm for Bands } 3, 8, 12, 13, 14, 17, 20.$

There are no measurement gaps overlapping with the PRS subframes in cells belonging to the serving carrier frequency.

The parameter expectedRSTDUncertainty signalled over LPP by E-SMLC as defined in 3GPP TS 36.355 [24] is less than 5 µs.

Note 2: Ts is the basic timing unit defined in 3GPP TS 36.211 [16].

Conditions PRS Parameter Number Unit Accuracy of Subframes **Transmission** Bands Bands [Ts] **Bands Bands Bandwidth** Available for 1, 4, 6, 2, 5, 7 3, 8, 12, 9, 41 Measurements [RB] 13, 14, 10, 11, 18, 19, 17, 20 21, 24, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 lo lo lo lo -120dBm RSTD for -119dBm -118dBm 6, 15 ≥4 T_s ± 21 -121dBm /15kHz /15kHz /15kHz (PRS Ês/Iot)ref /15kHz ≥ -6dB and -50dBm/ -50dBm/ -50dBm/ -50dBm/ (PRS Ês/Iot)i 25 ≥2 ± 10 $\mathsf{BW}_\mathsf{Channel}$ **BW**_{Channel} **BW**Channel **BW**_{Channel} ≥ -13dB 50, 75, 100 ±9 ≥1

Table 9.1.10.2-1: RSTD measurement accuracy

Note 1: Io is assumed to have constant EPRE across the bandwidth. Note 2: Ts is the basic timing unit defined in 3GPP TS 36.211 [16].

9.1.10.3 RSTD Measurement Report Mapping

The reporting range of RSTD is defined from -15391 T_s to 15391 T_s with 1 T_s resolution for absolute value of RSTD less or equal to 4096 T_s and 5 T_s for absolute value of RSTD greater than 4096 T_s .

The mapping of measured quantity is defined in Table 9.1.10.3-1.

Table 9.1.10.3-1: RSTD report mapping

Reported Value	Measured Quantity Value	Unit
RSTD_0000	-15391 > RSTD	$T_{\rm s}$
RSTD_0001	-15391 ≤ RSTD < -15386	$T_{\rm s}$
RSTD_2258	-4106 ≤ RSTD < -4101	$T_{\rm s}$
RSTD_2259	-4101 ≤ RSTD < -4096	$T_{\rm s}$
RSTD_2260	-4096 ≤ RSTD < -4095	$T_{\rm s}$
RSTD_2261	-4095 ≤ RSTD < -4094	$T_{\rm s}$
RSTD_6353	-3 ≤ RSTD < -2	Ts
RSTD_6354	-2 ≤ RSTD < -1	Ts
RSTD_6355	-1 ≤ RSTD ≤ 0	T_s
RSTD_6356	0 < RSTD ≤ 1	T_s
RSTD_6357	1 < RSTD ≤ 2	Ts
RSTD_6358	2 < RSTD ≤ 3	Ts
•••		
RSTD_10450	4094 < RSTD ≤ 4095	Ts
RSTD_10451	4095 < RSTD ≤ 4096	Ts
RSTD_10452	4096 < RSTD ≤ 4101	Ts
RSTD_10453	4101 < RSTD ≤ 4106	Ts
•••		
RSTD_12709	15381 < RSTD ≤ 15386	Ts
RSTD_12710	15386 < RSTD ≤ 15391	Ts
RSTD_12711	15391 < RSTD	Ts

9.1.11 Carrier aggregation measurement accuracy

This section contains requirements on UE capabilities for support of E-UTRA carrier aggregation. Requirements in this section are applicable to all carrier aggregation capable UEs which have been configured with a downlink Scell. Note:

This section covers measurement accuracy requirements for frequencies corresponding to those used for the primary and secondary serving cell; measurements of any other frequency are considered to be inter-frequency measurements covered by the accuracy requirements in section 9.1.3 and 9.1.6

9.1.11.1 Primary component carrier accuracy requirement

RSRP and RSRQ measurements of cells on the primary component carrier shall meet the intrafrequency absolute accuracy requirements in sections 9.1.2.1 and 9.1.5.1. Comparisons between RSRP and RSRQ of cells on the primary component carrier shall also meet the intra-frequency relative accuracy requirements in sections 9.1.2.2 and 9.1.5.2.

9.1.11.2 Secondary component carrier accuracy requirement

RSRP and RSRQ measurements of cells on the secondary component carrier shall meet the intrafrequency absolute accuracy requirements in sections 9.1.2.1 and 9.1.5.1. Comparisons between RSRP and RSRQ of cells on the secondary component carrier shall meet the intra-frequency relative accuracy requirements in sections 9.1.2.2 and 9.1.5.2

9.1.11.3 Primary and secondary component carrier relative accuracy requirement

When measurements of cells on the primary component carrier are compared with measurements of cells on the secondary component carrier, the applicable relative accuracy requirements are the RSRP and RSRQ inter-frequency accuracy requirements in sections 9.1.3.2 and 9.1.6.2.

9.2 UTRAN FDD Measurements

The requirements in this clause are applicable for a UE:

- in state RRC_CONNECTED
- performing measurements according to section 8.1.2.4.1 with appropriate measurement gaps
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in 3GPP TS 25.302 [6].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.2.1 UTRAN FDD CPICH RSCP

NOTE: This measurement is for handover between E-UTRAN and UTRAN FDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in section 8.1.2.4.1.

In RRC_CONNECTED state the accuracy requirements shall meet the absolute accuracy requirements in table 9.2.1-1,.

Table 9.2.1-1: UTRAN FDD CPICH_RSCP absolute accuracy

A			cy [dB]	Conditions			
				Band I, IV, VI, X	Band II, V and	Band III, VIII,	Band IX
Parameter	Unit	Normal	Extreme	XI, XIX and XXI	VII	XII, XIII and XIV	
		condition	condition	lo	lo	lo	lo
				[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]
CPICH_RSCP	dBm	±6	± 9	-9470	-9270	-9170	-9370
CPICH_RSCP	dBm	± 8	± 11	-7050	-7050	-7050	-7050

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in section 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH RSCP in 3GPP TS 25.133 [18] shall apply.

9.2.2 UTRAN FDD carrier RSSI

NOTE: This measurement is for handover between E-UTRAN and UTRAN FDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is equal to the measurement period for FDD CPICH measurements, whose measurement period is specified in section 8.1.2.4.1.

In RRC_CONNECTED state the accuracy requirements shall be the same as the measurement accuracy requirements for FDD carrier RSSI in 3GPP TS 25.133 [18].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in section 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD carrier RSSI in 3GPP TS 25.133 [18] shall apply.

9.2.3 UTRAN FDD CPICH Ec/No

NOTE: This measurement is for handover between E-UTRAN and UTRAN FDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in section 8.1.2.4.1.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for FDD CPICH Ec/No in 3GPP TS 25.133 [18].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN FDD measurements, the UTRAN FDD measurement procedure and measurement gap pattern stated in section 8.1.2.4.1 shall apply.

The reporting range and mapping specified for FDD CPICH Ec/No in 3GPP TS 25.133 [18] shall apply.

9.3 UTRAN TDD Measurements

The requirements in this clause are applicable for a UE:

- in state RRC_CONNECTED
- performing measurements according to section 8.1.2.4.3 with appropriate measurement gaps
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in 3GPP TS 25.302 [6].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.3.1 UTRAN TDD P-CCPCH RSCP

NOTE: This measurement is for handover between E-UTRAN and UTRAN TDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in section 8.1.2.4.3.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for TDD P-CCPCH in 3GPP TS 25.123 [19].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the UTRAN TDD measurement procedure and measurement gap pattern stated in section 8.1.2.4.3 shall apply.

The reporting range and mapping specified for TDD P-CCPCH RSCP in 3GPP TS 25.123 [19] shall apply.

9.3.2 UTRAN TDD carrier RSSI

NOTE: This measurement is for handover between E-UTRAN and UTRAN TDD.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is equal to the measurement period for TDD P-CCPCH RSCP measurement, whose measurement period is specified in section 8.1.2.4.3.

In RRC_CONNECTED state the accuracy requirements shall be the same as the inter-frequency measurement accuracy requirements for TDD carrier RSSI in 3GPP TS 25.123 [19].

If the UE, in RRC_CONNECTED state, needs measurement gaps to perform UTRAN TDD measurements, the UTRAN TDD measurement procedure and measurement gap pattern stated in section 8.1.2.4.3 shall apply.

The reporting range and mapping specified for TDD carrier RSSI in 3GPP TS 25.123 [19] shall apply.

9.3.3 Void

9.4 GSM Measurements

The requirements in this clause are applicable for a UE:

- in state RRC CONNECTED
- performing measurements according to section 8.1.2.4.5 with appropriate measurement gaps
- that is synchronised to the cell that is measured.

The reported measurement result after layer 1 filtering shall be an estimate of the average value of the measured quantity over the measurement period. The reference point for the measurement result after layer 1 filtering is referred to as point B in the measurement model described in 3GPP TS 25.302 [6].

The accuracy requirements in this clause are valid for the reported measurement result after layer 1 filtering. The accuracy requirements are verified from the measurement report at point D in the measurement model having the layer 3 filtering disabled.

9.4.1 GSM carrier RSSI

NOTE: This measurement is for handover between E-UTRAN and GSM.

The requirements in this section are valid for terminals supporting this capability.

The measurement period for RRC_CONNECTED state is specified in section 8.1.2.4.5.

In RRC_CONNECTED state the measurement accuracy requirements for RXLEV in TS 45.008 [8] shall apply.

If the UE, in RRC_CONNECED state, needs measurement gaps to perform GSM measurements, the GSM measurement procedure and measurement gap pattern stated in section 8.1.2.4.5 shall apply.

The reporting range and mapping specified for RXLEV in TS 45.008 [8] shall apply.

9.5 CDMA2000 1x RTT Measurements

The requirements in this clause are applicable for a UE:

- in RRC_CONNECTED state.
- synchronised to the cell that is measured.

9.5.1 CDMA2000 1x RTT Pilot Strength

NOTE: This measurement is for handover between E-UTRAN and cdma2000 1 x RTT.

The requirements in this section are valid for terminals supporting this capability.

CDMA2000 1xRTT Pilot Strength defined in sub-clause 5.1.10 of [4] shall meet the performance requirement defined in sub-clause 3.2.4 of [14] on the cdma2000 1xRTT neighbour cells indicated by the serving eNode B.

10 Measurements Performance Requirements for E-UTRAN

10.1 Received Interference Power

The measurement period shall be 100 ms.

10.1.1 Absolute accuracy requirement

Table 10.1.1-1: Received Interference Power absolute accuracy

Parameter	Unit	Accuracy	Conditions
		[dB]	lob [dBm/180 kHz]
lob	dBm/180 kHz	± 4	-11796

10.1.2 Relative accuracy requirement

The relative accuracy is defined as the Received Interference Power measured at one frequency compared to the Received Interference Power measured from the same frequency at a different time.

Table 10.1.2-1: Received Interference Power relative accuracy

Parameter	Unit	Accuracy	Conditions
		[dB]	lob [dBm/180 kHz]
lob	dBm/180 kHz	± 0.5	-117 - 96
			AND for changes ≤ ±9.0 dB

10.1.3 Received Interference Power measurement report mapping

The reporting range for Received Interference Power (RIP) is from -126 ... -75 dBm.

In table 10.2.3-1 the mapping of measured quantity is defined. The range in the signalling may be larger than the guaranteed accuracy range.

Table 10.1.3-1: Received Interference Power measurement reporting range

Reported value	Measured quantity value	Unit
RTWP_LEV _000	RIP < -126.0	dBm
RTWP_LEV _001	-126.0 ≤ RIP < -125.9	dBm
RTWP_LEV _002	-125.9 ≤ RIP < -125.8	dBm
RTWP_LEV _509	-75.2 ≤ RIP < -75.1	dBm
RTWP_LEV _510	-75.1 ≤ RIP < -75.0	dBm
RTWP_LEV _511	-75.0 ≤ RIP	dBm

10.2 Angle of Arrival (AOA)

10.2.1 Range/mapping

The reporting range for AOA measurement is from 0 to 360 degree, with resolution of 0.5 degree.

The mapping of the measured quantity is defined in table 10.2.1-1.

Table 10.2.1-1: AOA measurement report mapping

Reported value	Measured quantity value	Unit
AOA_ANGLE _000	0 ≤ AOA_ANGLE < 0.5	degree
AOA_ANGLE _001	0.5 ≤ AOA_ANGLE < 1	degree
AOA_ANGLE _002	1 ≤ AOA_ANGLE < 1.5	degree
•••	•••	
AOA_ANGLE _717	358.5 ≤ AOA_ANGLE < 359	degree
AOA_ANGLE _718	359 ≤ AOA_ANGLE < 359.5	degree
AOA_ANGLE _719	359.5 ≤ AOA_ANGLE < 360	degree

10.3 Timing Advance (T_{ADV})

10.3.1 Report mapping

The reporting range of T_{ADV} is defined from 0 to $49232T_s$ with $2T_s$ resolution for timing advance less or equal to $4096T_s$ and $8T_s$ for timing advance greater than $4096T_s$.

The mapping of measured quantity is defined in Table 10.3.1-1.

Table 10.3.1-1: T_{ADV} measurement report mapping

Reported value	Measured quantity value	Unit
TIME_ADVANCE_00	T _{ADV} < 2	T_s
TIME_ADVANCE_01	2 ≤ T _{ADV} < 4	Ts
TIME_ADVANCE_02	$4 \le T_{ADV} < 6$	Ts
TIME_ADVANCE_2046	$4092 \le T_{ADV} < 4094$	Ts
TIME_ADVANCE_2047	4094 ≤ T _{ADV} < 4096	T _s
TIME_ADVANCE_2048	4096 ≤ T _{ADV} < 4104	T _s
TIME_ADVANCE_2049	$4104 \le T_{ADV} < 4112$	Ts
•••	***	
TIME_ADVANCE_7688	49216 ≤ T _{ADV} < 49224	T _s
TIME_ADVANCE_7689	49224 ≤ T _{ADV} < 49232	T _s
TIME_ADVANCE_7690	49232 ≤ T _{ADV}	Ts

Annex A (normative): Test Cases

A.1 Purpose of annex

This Annex specifies test specific parameters for some of the functional requirements in sections 4 to 9. The tests provide additional information to how the requirements should be interpreted for the purpose of conformance testing. The tests in this Annex are described such that one functional requirement may be tested in one or several test and one test may verify several requirements. Some requirements may lack a test.

The conformance tests are specified in TS 36.521-3 [23]. Statistical interpretation of the requirements is described in Annex A.2.

A.2 Requirement classification for statistical testing

Requirements in this specification are either 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 the parameter is tested.

Annex A outlines the tests in more detail and lists the test parameters needed. The test will result in an outcome of a test variable value for the device under test (DUT) inside or outside the test limit. Overall, the probability of a "good" DUT being inside the test limit(s) and the probability of a "bad" DUT being outside the test limit(s) should be as high as possible. For this reason, when selecting the test variable and the test limit(s), the statistical nature of the test is accounted for.

The statistical nature depends on the type of 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 DUT passing the test actually meets the requirements and determines how many times a test has to be repeated and what the pass and fail criteria are. Those aspects are not covered by TS 36.133. The details of the tests on how many times to run it and how to establish confidence in the tests are described in TS 36.521-3 [23]. This Annex establishes the variable to be used in the test and whether it can be viewed as statistical in nature or not.

A.2.1 Types of requirements in TS 36.133

A.2.1.1 Time and delay requirements on UE higher layer actions

A very large part of the RRM requirements are delay requirements:

- In E-UTRAN RRC_IDLE state mobility (clause A.4) there is cell re-selection delay.
- In E-UTRAN RRC_CONNECTED state mobility (clauses A.5 and A.8) there is handover delay, cell search delay and measurement reporting delay.
- In RRC Connection Control (clause A.6) there is RRC re-establishment delay.

All have in common that the UE is required to perform an action observable in higher layers (e.g. camp on the correct cell) within a certain time after a specific event (e.g. when a new strong pilot or reference signal appears). The delay time is statistical in nature for several reasons, among others that several of the measurements are performed by the UE in a fading radio environment.

The variations make a strict limit unsuitable for a test. Instead there is a condition set for a correct action by the UE, e.g. that the UE shall camp on the correct cell within X seconds. Then the rate of correct events is observed during repeated tests and a limit is set on the rate of correct events, usually 90% correct events are required. How the limit is applied in the test depends on the confidence required, further detailed are in TS 36.521-3 [23].

A.2.1.2 Measurements of power levels, relative powers and time

A very large number of requirements are on measurements that the UE performs:

- In E-UTRAN RRC_CONNECTED state mobility (clause A.5) there are measurement reports.
- In Measurement Performance Requirements (clause A.9) there are requirements for all type of measurements.

The accuracy requirements on measurements are expressed in this specification as a fixed limit (e.g. +/-X dB), but the measurement error will have a distribution that is not easily confined in fixed limits. Assuming a Gaussian distribution of the error, the limits will have to be set at +/-3.29 σ if the probability of failing a "good DUT" in a single test is to be kept at 0.1%. It is more reasonable to set the limit tighter and test the DUT by counting the rate of measurements that are within the limits, in a way similar to the requirements on delay.

A.2.1.3 Implementation requirements

A few requirements are strict actions the UE should take or capabilities the UE should have, without any allowance for deviations. These requirements are absolute and should be tested as such. Examples are:

- "Event triggered report rate" in E-UTRAN RRC_CONNECTED state mobility (clauses A.5 and A.8)
- "Correct behaviour at time-out" in RRC connection control (clause A.6)

A.2.1.4 Physical layer timing requirements

There are requirements on Timing and Signaling Characteristics (clauses A.7). There are both absolute and relative limits on timing accuracy depending upon the type of requirement. Examples are:

- Initial Transmit Timing (clause A.7.1) has an absolute limit on timing accuracy.
- Timing Advance (clause A.7.2) has a relative limit on timing accuracy.

A.3 RRM test configurations

A.3.1 Reference Measurement Channels

A.3.1.1 PDSCH

A.3.1.1.1 FDD

Table A.3.1.1.1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit			Va	lue		
Reference channel		R.2 FDD			R.0 FDD	R.1 FDD	
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1			1	2	
Allocated resource blocks (Note 4)		2			24	24	
Allocated subframes per Radio Frame		10			10	10	
Modulation		QPSK			QPSK	QPSK	
Target Coding Rate		1/3			1/3	1/3	
Information Bit Payload							
For Sub-Frames 4, 9	Bits	120			2088	2088	
For Sub-Frame 5	Bits	104			2088	1736	
For Sub-Frame 0	Bits	32			1736	1736	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0			0	0	
Number of Code Blocks per Sub-Frame		1			1	1	
(Note 5)							
For Sub-Frames 4, 9		1			1	1	
For Sub-Frame 5		1			1	1	
For Sub-Frame 0		1			1	1	
For Sub-Frame 1, 2, 3, 6, 7, 8		0			0	0	
Binary Channel Bits Per Sub-Frame							
For Sub-Frames 4, 9	Bits	456			6624	6336	
For Sub-Frame 5	Bits	360			6336	6048	
For Sub-Frame 0	Bits	176			5784	5520	
For Sub-Frame 1, 2, 3, 6, 7, 8	Bits	0			0	0	
Max. Throughput averaged over 1 frame	kbps	37.6			800	765	

Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW.

Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [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].

Note 4: Allocation is located in the middle of bandwidth.

Note 5: If more than one Code Block is present, an additional CRC sequence of L=24 Bits is attached to each Code Block (otherwise L=0 Bit)

Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.3.1.1.2 TDD

Table A.3.1.1.2-1: PDSCH Reference Measurement Channels for TDD

Parameter	Unit	Value					
Reference channel		R.2 TDD			R.0 TDD	R.1 TDD	
Channel bandwidth	MHz	1.4	3	5	10	10	20
Number of transmitter antennas		1			1	2	
Allocated resource blocks (Note 4)		2			24	24	
Uplink-Downlink Configuration (Note 5)		1			1	1	

Special Subframe Configuration (Note 6)		6		6	6	
Allocated subframes per Radio Frame		6		6	6	
Modulation		QPSK		QPSK	QPSK	
Target Coding Rate		1/3		1/3	1/3	
Information Bit Payload						
For Sub-Frames 4,9	Bits	120		2088	2088	
For Sub-Frame 5	Bits	104		2088	2088	
For Sub-Frame 0	Bits	56		2088	1736	
For Sub-Frame 1, 6 (DwPTS)	Bits	56		1032	1032	
Number of Code Blocks per Sub-Frame		1		1	1	
(Note 7)						
For Sub-Frames 4,9		1		1	1	
For Sub-Frame 5		1		1	1	
For Sub-Frame 0		1		1	1	
For Sub-Frame 1, 6 (DwPTS)		1		1	1	
Binary Channel Bits Per Sub-Frame						
For Sub-Frames 4,9	Bits	456		6624	6336	
For Sub-Frame 5	Bits	408		6480	6192	
For Sub-Frame 0	Bits	224		5928	5664	
For Sub-Frame 1, 6 (DwPTS)	Bits	272		3696	3504	
Max. Throughput averaged over 1 frame	Mbps	0.051		1.041	1.0064	
		2		6		

- Note 1: 2 symbols allocated to PDCCH for 10 MHz channel BW. 4 symbols allocated to PDCCH for 1.4 MHz channel BW. For special subframe (1 & 6) only 2 OFDM symbols are allocated to PDCCH for all bandwidths.
- Note 2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [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].
- Note 4: Allocation is located in the middle of bandwidth.
- Note 5: As per Table 4.2-2 in TS 36.211 [16]
- Note 6: As per Table 4.2-1 in TS 36.211 [16]
- Note 7: If more than one Code Block is present, an additional CRC sequence of L = 24 Bits is attached to each Code Block (otherwise L = 0 Bit)
- Note 8: PDSCH allocation applies only to subframes not configured as PRS subframes.

A.3.1.2 PCFICH/PDCCH/PHICH

A.3.1.2.1 FDD

Table A.3.1.2.1-1: PCFICH/PDCCH/PHICH Reference Channel for FDD

Parameter	Unit		Va	alue		
Reference channel		R.8		R.6	R.7	
		FDD		FDD	FDD	
Channel bandwidth	MHz	1.4		10	10	
Number of transmitter antennas		1		1	2	
Control region OFDM symbols ^{Note1}	symbols	4		2	2	
Aggregation level	CCE	2		8	8	
		(Note 6)				
DCI Format		Note 3		Note 3	Note 3	
Cell ID		Note 4		Note 4	Note 4	
Payload (without CRC)	Bits	Note 5		Note 5	Note 5	

- Note 1: The control region consists of PCFICH, PHICH and PDCCH.
- Note 2: DCI formats are defined in 3GPP TS 36.212.
- Note 3: DCI format shall depend upon the test configuration.
- Note 4: Cell ID shall depend upon the test configuration.
- Note 5: Payload size shall depend upon the test configuration.
- Note 6: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.3.1.2.2 TDD

Table A.3.1.2.2-1: PCFICH/PDCCH/PHICH Reference Channel for TDD

Parameter	Unit	Value					
Reference channel		R.8 TDD			R.6 TDD	R.7 TDD	
Channel bandwidth	MHz	1.4			10	10	
Number of transmitter antennas		1			1	2	
Control region OFDM symbols ^{Note1}	symbols	4 (Note 6)			2	2	
Aggregation level	CCE	2 (Note 7)			8	8	
DCI Format		Note 3			Note 3	Note 3	
Cell ID		Note 4			Note 4	Note 4	
Payload (without CRC)	Bits	Note 5			Note 5	Note 5	

- Note 1: The control region consists of PCFICH, PHICH and PDCCH.
- Note 2: DCI formats are defined in 3GPP TS 36.212.
- Note 3: DCI format shall depend upon the test configuration.
- Note 4: Cell ID shall depend upon the test configuration.
- Note 5: Payload size shall depend upon the test configuration.
- Note 6: Only 2 OFDM symbols for special subframes 1 and 6.
- Note 7: For PDCCH using SI/RA/P-RNTI, Aggregation level 4 is used.

A.3.2 OFDMA Channel Noise Generator (OCNG)

A.3.2.1 OCNG Patterns for FDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test) and/or allocations used for MBSFN. The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols without and with reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i _RA/OCNG _RA = PDSCH_i _RB/OCNG _RB,$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a constant transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. For any aggregation and PHICH allocation, the PDCCH is padded with resource element groups with a power level given by PDCCH_RA and PDCCH_RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

A.3.2.1.1 OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz

Table A.3.2.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

Allocation $n_{\it PRB}$	Re	Relative power level γ_{PRB} [dB] Subframe					
	0	5	4,9	1-3, 6-8			
0 – 12	0	0	0	N/A	Note 1	N/A	
37 – 49	0	0	0	N/A	Note	IN/A	
0-49	N/A	N/A	N/A	Note 4	N/A	Note 2	

- Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.
- Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
- Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz

Table A.3.2.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

Rel	PDSCH Data	PMCH Data			
0	5	4, 9	1 – 3, 6 – 8		
0	0	0	N/A	Note 1	N/A
N/A	N/A	N/A	Note 4	N/A	Note 2
-	0 0 N/A	Subfr 0 5 0 0 N/A N/A	Subframe 0 5 4, 9 0 0 0 N/A N/A N/A	0 5 4, 9 1 - 3, 6 - 8 0 0 0 N/A N/A N/A N/A Note 4	Subframe 0 5 4, 9 1 - 3, 6 - 8 0 0 N/A Note 1

- Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.
- Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.
- Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.3 OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.1.3-1: OP.3 FDD: OCNG FDD Pattern 3

Allocation	Re	PDSCH Data	PMCH Data				
$n_{\it PRB}$		Subframe					
	0	5	4.9	1-3 6-8			

0 – 1	0	0	0	N/A	Note 1	N/A
4 – 5	0	0	0	N/A	110101	14/71
0 – 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall not contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.1.4-1: OP.4 FDD: OCNG FDD Pattern 4

Allocation n_{PRB}	Relative power level $\gamma_{\it PRB}$ [dB] Subframe					PMCH Data
	0	5	4, 9	1 – 3, 6 – 8		
0 – 5	0	0	0	N/A	Note 1	N/A
0 – 5	N/A	N/A	N/A	Note 4	N/A	Note 2

Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRR} is used to scale the power of PDSCH.

Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH subframes shall contain cell-specific Reference Signals only in the first symbol of the first time slot. The parameter γ_{PRB} is used to scale the power of PMCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS

N/A: Not Applicable

A.3.2.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)

Table A.3.2.1.5-1: OP.5 FDD: OCNG FDD Pattern 5

Allocation $n_{\it PRB}$		Relative power level $\gamma_{\it PRB}$ [dB] Subframe (Note 1)							
	0	5	4,9	1-3, 6-8					
0 – 12	0	0	0	N/A					
37 – 49	0	0	0	N/A	Note 2				
0 – 49	N/A	N/A	N/A	0					

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated.

The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The

parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

N/A: Not Applicable

A.3.2.1.6 OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN)

Table A.3.2.1.6-1: OP.6 FDD: OCNG FDD Pattern 6

Alloc		Re	lative power I	evel $\gamma_{{\scriptscriptstyle PRB}}$ [d	B]	PDSCH Data	
n_P	PRB	Subframe (No	ote 1)			Data	
		0	5	4, 9	1 – 3, 6 – 8		
0 –	49	0	0	0	0	Note 2	
Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.							
Note 2:	These p	hysical resource		ssigned to an		er of	

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power of the PDSCH part of OCNG is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213. N/A: Not Applicable

A.3.2.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)

Table A.3.2.1.8-1: OP.7 FDD: OCNG FDD Pattern 7

Alloc		Relative power level γ_{PRB} [dB]						
n_P	<i>n</i> _{PRB} Subframe (Note 1)							
		0	5	4, 9	1 – 3, 6 – 8			
0 -	- 5	0	0	0	0	Note 2		
Note 1: Note 2:	subframes.				er of ver the			
Note 3:	QPSK m PDSCH If two or PDSCH	PDSCHs shall be nodulated. The post of transmit apart of OCNG stantants with the part of ocnown antennas with the control of the part of ocnown antennas with the control ocnown and the control ocnown an	parameter $\gamma_{_I}$ antennas with shall be transn	$_{PRB}^{\circ}$ is used to s CRS are used nitted to the vir	scale the power in the test, the tual users by	er of e all the		
N/A:	the trans transmit	The parameter smit power of the antennas with are specified in slicable	ie PDSCH par CRS used in tl	t of OCNG is ene test. The ar	equal between ntenna transmi	all the		

A.3.2.2 OCNG Patterns for TDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test). The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG_RA and OCNG_RB which together with a relative power level (γ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols without and with reference symbols, respectively. The relative power, which is used for modelling boosting per virtual UE allocation, is expressed by:

$$\gamma_i = PDSCH_i _RA / OCNG _RA = PDSCH_i _RB / OCNG _RB$$

where γ_i denotes the relative power level of the *i:th* virtual UE. The parameter settings of OCNG_RA, OCNG_RB, and the set of relative power levels γ are chosen such that when also taking allocations to the UE under test into account, as given by a PDSCH reference channel, a transmitted power spectral density that is constant on an OFDM symbol basis is targeted.

Moreover the OCNG pattern is accompanied by a PCFICH/PDCCH/PHICH reference channel which specifies the control region. For any aggregation and PHICH allocation, the PDCCH is padded with resource element groups with a power level given by PDCCH_RA and PDCCH_RB as specified in the test case such that a total power spectral density in the control region that is constant on an OFDM symbol basis is targeted.

A.3.2.2.1 OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz

Table A.3.2.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

Allocation	Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]	PDSCH Data
$n_{\it PRB}$	Subframe (Note 1)	

	0	5	3 , 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe)	
0 – 12	0	0	0	Table	N. t. O
37 – 49	0	0	0	A.3.2.2.1-2	Note 2

- Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

Table A.3.2.2.1-2: OP.1 TDD: OCNG TDD Pattern 1 for special subframe configuration with 5ms downlink-to-uplink switch-point periodicity

Allocation	Ę		Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]							
$n_{\it PRB}$	length			Sı	oecial sub	frame cor	nfiguration)		
	<u>o</u>	0	1	2	3	4	5	6	7	8
	C C			С	ontrol reg	ion OFDN	l symbols			
		1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
0 – 12		0	0	0	0	0	0	0	0	0
0 - 12	N	O	0	O	O	O	U	0	$>\!\!<$	$>\!\!<$
37 – 49		_	0	0	0	0	_	0	0	0
31 - 49	N	U	U	U	U	U	U	J	\searrow	$>\!\!<$
Note 1: Special su	ubframe o	configuratio	ns are defi	ned in Table	e 4.2-1 in 1	S 36.211	[16].			

A.3.2.2.2 OCNG TDD pattern 2: full bandwidth allocation in 10 MHz

Table A.3.2.2.2-1: OP.2 TDD: OCNG TDD Pattern 2 for 5ms downlink-to-uplink switch-point periodicity

Allocation			PDSCH Data					
$n_{{\scriptscriptstyle PRB}}$		Subframe	(Note 1)					
	0	5						
0 – 49	0	0	0	0	Note 2			

Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.

Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.

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

Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

A.3.2.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz

Table A.3.2.2.3-1: OP.3 TDD: OCNG TDD Pattern 3 for 5 ms downlink-to-uplink switch-point periodicity

Allocation		PDSCH Data			
n_{PRB}		Subframe	(Note 1)		
	0	5	3, 4, 8, 9 and 6 (as normal subframe) Note 3	1 and 6 (as special subframe)	

0 – 1	0	0	0	0	N 1 0
4 – 5	0	0	0	0	Note 2

- Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration defined in Table 4.2-2 in 3GPP TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

A.3.2.2.4 OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz

Table A.3.2.2.4-1: OP.4 TDD: OCNG TDD Pattern 4 for 5 ms downlink-to-uplink switch-point periodicity

	ation	_	PDSCH Data				
n_I	PRB	g j		Subframe	(Note 1)		
	n _{PRB} O O				3 , 4, 8, 9 and 6 (as normal subframe)	1 and 6 (as special subframe)	
	0 – 5		0	0	0	0	Note 2

- Note 1: PDSCH allocation applies only to subframes not configured as PRS subframes.
- Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter γ_{PRB} is used to scale the power of PDSCH.
- Note 3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP TS 36.211 [16].
- Note 4: If two or more transmit antennas with CRS are used in the test, the OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter γ_{PRB} applies to each antenna port separately, so the transmit power is equal between all the transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.

A.3.3 Reference DRX Configurations

Table A.3.3-1: Reference DRX Configurations

Parameter	Va	lue	Comments				
Reference configuration	DRX_S	DRX_L	As defined in 4.8.2.1.5 in TS 36.508				
onDurationTimer	psf2	psf6					
drx-InactivityTimer	psf100	psf1920					
drx-RetransmissionTimer	psf16	psf16					
IongDRX-CycleStartOffset	sf40, 0	sf1280, 0					
shortDRX	disabled	disabled					
Note: For further information see section 6.3.2 in 3GPP TS 36.331.							

A.4 E-UTRAN RRC_IDLE state

A.4.2 Cell Re-Selection

A.4.2.1 E-UTRAN FDD – FDD Intra frequency case

A.4.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency cell reselection requirements specified in section 4.2.2.3.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.4.2.1.1-1 and A.4.2.1.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

Table A.4.2.1.1-1: General test parameters for FDD intra frequency cell reselection test case

F	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cells		Cell2	
T2 end	Active cell		Cell2	
condition	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA R	F Channel Number		1	Only one FDD carrier frequency is used.
Channel B	andwidth (BW _{channel})	MHz	10	
Time offset	t between cells		3 ms	Asynchronous cells
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
PRACH co	nfiguration		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	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		S	40	T2 need to be defined so that cell re- selection reaction time is taken into account.
T3		S	15	T3 need to be defined so that cell reselection reaction time is taken into account.

Table A.4.2.1.1-2: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	T3	T1	T1 T2 T3		
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns								
defined in A.3.2.1.2		C	P.2 FDD			OP.2 FDD		
(OP.2 FDD)								
PBCH_RA								
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB	dB		0			0		
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_			RSRP			RSRP		
measurement								
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	16	-3.11	2.79	-infinity	2.79	-3.11	
$N_{oc}^{ m Note2}$	dBm/15 kHz				-98			
\hat{E}_s/N_{oc}	dB	16	13	16	-infinity	16	13	
RSRP Note3	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85	
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.

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.

A.4.2.1.2 Test Requirements

The cell reselection 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 shall be less than 34 s.

The cell reselection 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 shall be less than 8 s.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{\text{detect,EUTRAN_Intra}} + T_{\text{SI}}$, and to an already detected cell can be expressed as: $T_{\text{evaluateFDD.intra}} + T_{\text{SI}}$,

Where:

T_{detect,EUTRAN_Intra} See Table 4.2.2.3-1 in section 4.2.2.3

T_{evaluateFDD,intra} See Table 4.2.2.3-1 in section 4.2.2.3

T_{SI} 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 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

A.4.2.2 E-UTRAN TDD – TDD Intra frequency case

A.4.2.2.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD intra frequency cell reselection requirements specified in section 4.2.2.3.

The test scenario comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables A.4.2.2.1-1 and A.4.2.2.1-2. The test consists of three successive time periods, with time duration of T1, T2, and T3 respectively. Only cell 1 is already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.2.1-1: General test parameters for TDD intra frequency cell re-selection test case

F	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cells		Cell2	
T2 end	Active cell		Cell2	
condition	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
E-UTRA R	F Channel Number		1	Only one TDD carrier frequency is used.
Channel Ba	andwidth (BW _{channel})	MHz	10	
Time offset	e offset between cells		3	Synchronous cells
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
Special sub	oframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH co	nfiguration index		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		S	40	T2 need to be defined so that cell re-selection reaction time is taken into account.
Т3		S	15	T3 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.2.2.1-2: Cell specific test parameters for TDD intra frequency cell re-selection test case in AWGN

Parameter	Unit		Cell 1			Cell 2				
		T1	T2	T3	T1	T2	T3			
E-UTRA RF Channel			1			1				
Number										
BW _{channel}	MHz		10		10					
OCNG Pattern										
defined in A.3.2.2.2		OP.2 TDD			OI	P.2 TDD				
(OP.2 TDD)										
PBCH_RA										
PBCH_RB										
PSS_RA										
SSS_RA										
PCFICH_RB										
PHICH_RA										
PHICH_RB	dB		0			0				
PDCCH_RA										
PDCCH_RB										
PDSCH_RA										
PDSCH_RB										
OCNG_RA ^{Note 1}										
OCNG_RB ^{Note 1}										
Qrxlevmin	dBm		-140			-140				
Pcompensation	dB		0			0				
Qhysts	dB		0			0				
Qoffset _{s, n}	dB		0			0				
Cell_selection_and_										
reselection_quality_		RSRP				RSRP				
measurement										
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	16	-3.11	2.79	-infinity	2.79	-3.11			
N_{oc} Note2	dBm/15 kHz			-	98					
			1			1				
\hat{E}_s/N_{oc}	dB	16	13	16	-infinity	16	13			
RSRP Note3	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85			
Treselection	S	0	0	0	0	0	0			
Sintrasearch	dB	N	ot sent	•	N	ot sent	•			
Propagation				A۷	VGN					
Condition										
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 f	rom other cells and r	noise sources	not speci	fied in the	e test is assum	ned to be o	constant			
						N				
over subcarrie	ers and time and sha	III be modelle	d as AWG	SN of app	ropriate power	for oc	to be			
Tullillea.										
	have been derived fr meters themselves.	om omer par	ameters it	אוווטוווו וכ	mon purposes	. They are	HUL			
Schable parai	notoro triornocivos.									

A.4.2.2.2 Test Requirements

The cell reselection 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 shall be less than 34 s.

The cell reselection 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 shall be less than 8 s.

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

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{\text{detect,EUTRAN_Intra}} + T_{\text{SI-EUTRAN}}$, and to an already detected cell can be expressed as: $T_{\text{evaluate, E-UTRAN_intra}} + T_{\text{SI-EUTRAN}}$,

Where:

T_{detect,EUTRAN_Intra} See Table 4.2.2.3-1 in section 4.2.2.3

 $T_{evaluate, E\text{-}UTRAN_\,intra} \quad See \; Table \; 4.2.2.3\text{-}1 \; in \; section \; 4.2.2.3$

T_{SI-EUTRA} 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 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell and 7.68 s, allow 8 s for the cell re-selection delay to an already detected cell in the test case.

A.4.2.3 E-UTRAN FDD – FDD Inter frequency case

A.4.2.3.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency cell reselection requirements specified in section 4.2.2.4.

The test scenario comprises of 2 E-UTRA FDD cells on 2 different carriers as given in tables A.4.2.3.1-1 and A.4.2.3.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.3.1-1: General test parameters for 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	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA R	F Channel Number		1, 2	Two FDD carrier frequencies are used.
Time offse	t between cells		3 ms	Asynchronous cells
PRACH co	onfiguration		4	As specified in table 5.7.1-2 in TS 36.211
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	s	1.28	The value shall be used for all cells in the test.
T1		S	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
T3		S	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.2.3.1-2: Cell specific test parameters for FDD-FDD inter-frequency cell reselection test case in AWGN

	T1	TO				Cell 2				
			T3	T1	T2	T3				
	1			2						
MHz		10		10						
	OP	.2 FDD		OP.2 FDD						
dB										
dB										
dB										
dB										
dB										
dB										
dB		0			0					
dB										
dB										
dB										
dB										
dB										
dB										
dBm		-140			-140					
dBm/15 kHz				-98						
dBm/15 KHz	-84	-84	-84	-102	-infinity	-86				
dB	14	14	14	-4	-infinity	12				
dB	14	14	14	-4	-infinity	12				
S	0				0					
dB	50				Not sent					
dB		48			48					
dB		44			44					
dB	50			50						
				AWGN						
	dB d	OP OB OB OB OB OB OB OB	OP.2 FDD dB	OP.2 FDD dB	OP.2 FDD dB	OP.2 FDD				

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.

A.4.2.3.2 Test Requirements

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 to perform a Tracking Area Update procedure on Cell 2.

The cell re-selection delay to higher priority shall be less than 68 s.

The cell reselection 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 shall be less than 8 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: $T_{higher_priority_search} + T_{evaluateFDD,inter} + T_{SI}$, and to lower priority cell can be expressed as: $T_{evaluateFDD,inter} + T_{SI}$,

Where:

 $T_{higher_priority_search}$ See section 4.2.2

T_{evaluateFDD,inter} See Table 4.2.2.4-1 in section 4.2.2.4

T_{SI} 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 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

A.4.2.4 E-UTRAN FDD – TDD Inter frequency case

A.4.2.5 E-UTRAN TDD – FDD Inter frequency case

A.4.2.6 E-UTRAN TDD – TDD: Inter frequency case

A.4.2.6.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD inter-frequency cell reselection requirements specified in section 4.2.2.4.

The test scenario comprises of 2 E-UTRA TDD cells on 2 different carriers as given in tables A.4.2.6.1-1 and A.4.2.6.1-2. The test consists of three successive time periods, with time duration of T1, T2, and T2 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.6.1-1: General test parameters for TDD-TDD inter frequency cell reselection 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	Active cells		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
E-UTRA R	F Channel Number		1, 2	Two TDD carrier frequencies are used.
Time offset	t between cells		3 μs	Synchronous cells
Access Ba	rring Information	1	Not Sent	No additional delays in random access procedure.
Special sul	oframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH co	nfiguration index		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
Т3		S	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.2.6.1-2: Cell specific test parameters for TDD-TDD inter-frequency cell reselection test case in AWGN

Parameter	Unit	Cell 1				Cell 2		
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1		2			
number								
BW _{channel}	MHz		10			10		
OCNG Pattern defined in								
A.3.2.2.2 (OP.2 TDD)		OF	P.2 TDD		0	P.2 TDD		
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB		0			0		
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							
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98							
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86		
\hat{E}_{s}/I_{ot}	dB	14	14	14	-4	-infinity	12		
\hat{E}_s/N_{oc}	dB	14	14	14	-4	-infinity	12		
Treselection _{EUTRAN}	S		0			0			
Snonintrasearch	dB		50		1	Not sent			
Thresh _{x, high}	dB		48			48			
Thresh _{serving, low}	dB		44			44			
Thresh _{x, low}	dB	50 50							
Propagation Condition				AV	VGN				

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 $N_{\rm act}$ to be fulfilled.

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

A.4.2.6.2 Test Requirements

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 to perform a Tracking Area Update procedure on cell 2.

The cell re-selection delay to higher priority shall be less than 68 s.

The cell reselection 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 shall be less than 8 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: $T_{higher_priority_search} + T_{evaluate,E-UTRAN_inter} + T_{SI-EUTRA}$, and to lower priority cell can be expressed as: $T_{evaluate,E-UTRAN_inter} + T_{SI-EUTRA}$,

Where:

T_{higher priority search} See section 4.2.2

T_{evaluate,E-UTRAN_inter} See Table 4.2.2.4-1 in section 4.2.2.4

T_{SI-EUTRA} 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 67.68 s for higher priority cell search and 7.68 s for lower priority cell search, allow 68 s for higher priority cell and 8 s for lower priority cell in the test case.

A.4.2.7 E-UTRAN FDD – FDD Inter frequency case in the existence of nonallowed CSG cell

A.4.2.7.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency cell reselection requirements specified in section 4.2.2.4 when there is the interference from non-allowed CSG cell and the layers have equal priority.

The test scenario comprises of 2 E-UTRA FDD cells on 2 different carriers and 1 non-allowed E-UTRA FDD CSG cell as given in tables A.4.2.7.1-1 and A.4.2.7.1-2. The test consists of two successive time periods, with time duration of T1

and T2 respectively. Both cell 1 and cell 3 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 3 is a non-allowed CSG cell. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.7.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA R	F Channel Number		1, 2	Two FDD carrier frequencies are used.
Time offset	t between cells		3 ms	Asynchronous cells
PRACH configuration		ACH configuration		As specified in table 5.7.1-2 in TS 36.211
Access Ba	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 the non-allowed CSG cell is identified.
T2		S	[40]	T2 need to be defined so that cell re-selection reaction time is taken into account.
Т3		S	[15]	T3 need to be defined so that whether cell reselection would not occur is insured.

Table A.4.2.7.1-2: Cell specific test parameters for FDD-FDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit	Cell 1		Cell 2			Cell 3(Non-allowed CSG cell)				
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3	
E-UTRA RF			1			2			1		
Channel Number											
BW _{channel}	MHz		10			10			10		
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD)			OP.2 FDI	D	OP.2 FDD			OP.2 FDD			
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB										
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB		0			0			0		
PDCCH_RA	dB		U			0			0		
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA ^{Note 1}	dB										
OCNG_RB ^{Note}	dB										

Qrxlevmin	dBm		-140		-140			-140		
Qqualmin	dB					[-20]				
$N_{oc}^{ m Note~2}$	dBm/15 kHz					-98				
RSRP Note 3	dBm/15 kHz	[-90]	[-90]	[-85]	[- Infinity]	[-85]	[-90]	[-90]	[-85]	[-60]
RSRQ Note 3	dB	[-14.1]	[-17.1]	[-35.8]	•			[-14.1]	[-12.1]	[-10.8]
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	[-0.64]	[-5.21]	[-25]	[- Infinity]	[13]	[8]	[-0.64]	[4.36]	[24.8]
\hat{E}_s/N_{oc}	dB	[8]	[8]	[13]	[- Infinity]	[13]	[8]	[8]	[13]	[38]
Treselection	S		0		0			0		
Snonintrasearch	dB	TBD			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_{ac} to be fulfilled.
- Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.4.2.7.2 Test Requirements

The cell reselection 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 shall be less than 34 s.

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

The probability of reselection from Cell 2 to Cell 1 during T3 observed during testing shall be less than [10%].

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{\text{detect,EUTRAN_Inter}} + T_{\text{SI}}$,

Where:

T_{detect ELITRAN Inter} See Table 4.2.2.4-1 in section 4.2.2.4

 T_{SI} 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 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell in the test case.

A.4.2.8 E-UTRAN TDD – TDD Inter frequency case in the existence of nonallowed CSG cell

A.4.2.8.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD inter-frequency cell reselection requirements specified in section 4.2.2.4 when there is the interference from non-allowed CSG cell and the layers have equal priority.

The test scenario comprises of 2 E-UTRA TDD cells on 2 different carriers and 1 non-allowed E-UTRA TDD CSG cell as given in tables A.4.2.8.1-1 and A.4.2.8.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 3 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 3 is a non-allowed CSG cell. Furthermore, UE has not registered with network for the tracking area containing cell 2.

Table A.4.2.8.1-1: General test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA R	F Channel Number		1, 2	Two TDD carrier frequencies are used.
Time offse	t between cells	μs	3	Synchronous cells
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
Special sul	Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
PRACH co	PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Access Ba	rring 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 the non-allowed CSG cell is identified.
T2		s	[40]	T2 need to be defined so that cell re-selection reaction time is taken into account.
ТЗ		s	[15]	T3 need to be defined so that whether cell reselection would not occur is insured.

Table A.4.2.8.1-2: Cell specific test parameters for TDD-TDD inter frequency cell re-selection test case with non-allowed CSG cell

Parameter	Unit		Cell 1		Cell 2			Cell 3		
								(Non-allowed CSG cell)		
		T1	T2	Т3	T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1			2			1	
Number										
BW _{channel}	MHz		10		10				10	
OCNG Pattern defined in		l ,	OP.2 TDD			OP.2 TDD			OP.2 TDD	,
A.3.2.2.2 (OP.2 TDD)		'	OF.Z TDL		OF	.2 100		'	OF.Z TDL	,
PBCH_RA	dB									
PBCH_RB	dB									
PSS_RA	dB									
SSS_RA	dB									
PCFICH_RB	dB									
PHICH_RA	dB									
PHICH_RB	dB		0			0			0	
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			-140		
Qqualmin	dB					[-20]				
N _{oc} Note 2	dBm/				-	-98				
	15kHz									
RSRP Note 3	dBm/	[-90]	[-90]	[-85]	[-Infinity]	[-85]	[-90]	[-90]	[-85]	[-60]
	15kHz									
RSRQ Note 3	dB	[-14.1]	[-17.1]	[-35.8]				[-14.1]	[-12.1]	[-10.8]
\hat{E}_{s}/I_{ot}	dB	[-0.64]	[-5.21]	[-25]	[-Infinity]	[13]	[8]	[-0.64]	[4.36]	[24.8]
\hat{E}_s/N_{oc}	dB	[8]	[8]	[13]	[-Infinity]	[13]	[8]	[8]	[13]	[38]
Treselection	S		0	•	0			0		
Snonintrasearch	dB	TBD Not sent Not se					Not sent			
Propagation Condition						WGN		•		
Note 1. OCNC shall be	upped pupe	that hath	s collo oro	ام برالي	otod and a	aanata	at total t	ranamitta	d nower o	naatral

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 RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.4.2.8.2 Test Requirements

The cell reselection 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 shall be less than 34 s.

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

The probability of reselection from Cell 2 to Cell 1 during T3 observed during testing shall be less than [10%].

NOTE: The cell re-selection delay to a newly detectable cell can be expressed as: $T_{detect,EUTRAN_Inter} + T_{SI}$,

Where:

T_{detect,EUTRAN_Inter} See Table 4.2.2.4-1 in section 4.2.2.4

T_{SI} 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 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell in the test case.

A.4.3 E-UTRAN to UTRAN Cell Re-Selection

A.4.3.1 E-UTRAN FDD – UTRAN FDD:

A.4.3.1.1 EUTRA FDD-UTRA FDD cell reselection: UTRA FDD is of higher priority

A.4.3.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRA FDD- UTRA FDD inter-RAT cell reselection requirements specified in section 4.2.2.5 when the UTRA cell is of higher priority.

The test scenario comprises of one E-UTRA FDD and one UTRA FDD cells as given in tables A.4.3.1.1.1-1, A.4.3.1.1.1-2 and A.4.3.1.1.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. E-UTRA cell 1 is already identified by the UE prior to the start of the test. Cell 2 is of higher priority than cell 1.

Table A.4.3.1.1.1: General test parameters for E-UTRA FDD- higher priority UTRA FDD inter RAT cell re-selection test case

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to cell 2 occurs during T2
T2 end	Active cell		Cell 2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell 1	
T3 end	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3
condition	Neighbour cell		Cell 2	
E-UTRA P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA A Information	access Barring	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		s	85	T2 needs to be defined so that cell re-selection reaction time is taken into account.
Т3		S	25	T3 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.3.1.1.1-2: Cell specific test parameters for cell 1(E-UTRA)

Parameter	Unit	Cell 1				
		T1	T3			
E-UTRA RF Channel		1				
number						
BW _{channel}	MHz		10			
OCNG Patterns defined in						
A.3.2.1.2 (OP.2 FDD)			OP.2 FDD)		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB		_			
PHICH_RB	dB		0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
Qqualmin for UTRA	dB		-20			
neighbour cell	uБ		-20			
Qrxlevmin for UTRA	dBm		-115			
neighbour cell	dDill		-113			
Qrxlevmin	dBm		-140			
N_{oc}	dBm/15 kHz		-98			
RSRP	dBm/15 KHz	-84	-84	-84		
	dB	14	14	14		
\hat{E}_{s}/I_{ot}	ab	14 14 14				
\hat{E}_s/N_{oc}	dB	14 14 14				
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 A.4.3.1.1.1-3: Cell specific test parameters for cell 2(UTRA)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2	T3	
UTRA RF Channel Number		(Channel 2	<u>)</u>	
CPICH_Ec/lor	dB		-10		
PCCPCH_Ec/lor	dB		-12		
SCH_Ec/lor	dB		-12		
PICH_Ec/lor	dB	-15			
OCNS_Ec/lor	dB	-0.941			
\hat{I}_{or}/I_{oc}	dB	-Infinity	-11	-5	
I_{oc}	dBm/3,84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity	-10.33	-16.19	
CPICH_RSCP	dBm	-Infinity -69 -85			
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 1: his refers to the value of Thresh _{x, low} which is included in UTRA					

Note 1: his 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

A.4.3.1.1.2 Test Requirements

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: $T_{higher_priority_search} + T_{evaluateUTRA_FDD} + T_{SI-UTRA}$

Where:

T_{higher_priority_search} See section 4.2.2; 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.

A.4.3.1.2 EUTRA FDD-UTRA FDD cell reselection: UTRA FDD is of lower priority

A.4.3.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA FDD- UTRA FDD inter-RAT cell reselection requirements specified in section 4.2.2.5.1 when the UTRA cell is of lower priority.

The test scenario comprises of one UTRA FDD and one E-UTRA FDD cells as given in tables A.4.3.1.2.1-1, A.4.3.1.2.1-2 and A.4.3.1.2.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.1.2.1-1: General test parameters for EUTRA FDD- lower priority UTRA FDD inter RAT cell re-selection test case

	Parameter	Unit	Value	Comment		
Initial condition	Active cell		Cell1	E-UTRAN cell		
T1 end condition	Active cells		Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test		
	Neighbour cell		Cell2			
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2		
condition	Neighbour cell		Cell1			
E-UTRA P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211		
E_UTRA A Information	access Barring	-	Not Sent	No additional delays in random access procedure.		
DRX cycle	DRX cycle length		RX 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.		

Table A.4.3.1.2.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit		Cell 1
		T1	T2
E-UTRA RF Channel			1
number			
BW _{channel}	MHz		10
OCNG Patterns defined in			
A.3.2.1.2 (OP.2 FDD)		OI	P.2 FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		_
PHICH_RB	dB		0
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB]	
PDSCH_RB	dB		
OCNG_RA ^{Note 1}	dB		
OCNG RB ^{Note 1}	dB		

Qqualmin for UTRA neighbour cell	dB	-20		
Qrxlevmin for UTRA neighbour cell	dBm	-115		
Qrxlevmin	dBm		-140	
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-86	-102	
\hat{E}_s/I_{ot}	dB	12	-4	
\hat{E}_s/N_{oc}	dB	12	-4	
Treselection _{EUTRAN}	S		0	
Snonintrasearch	dB	Not sent		
Thresh _{serving, low}	dB	44		
Thresh _{x, low} (Note 2)	dB	42		
Propagation Condition		, , , , , , , , , , , , , , , , , , ,	AWGN	
1				

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 A.4.3.1.2.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2		
UTRA RF Channel Number		Channel 2	2		
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
OCNS_Ec/lor	dB	-0.941			
\hat{I}_{or}/I_{oc}	dB	13	13		
I_{oc}	dBm/3,84 MHz	-70			
CPICH_Ec/lo	dB	-10.21	-10.21		
CPICH_RSCP	dBm	-67	-67		
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 1: This refers to the value of Thresh _x , high which is included					

A.4.3.1.2.2 Test Requirements

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.

in UTRA system information, and is a threshold for the

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

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

E-UTRA target cell

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

Where:

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

 $T_{\text{SI-UTRA}}$ 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 for lower priority cell reselection, allow 21 s.

A.4.3.1.3 EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is of lower priority

A.4.3.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA FDD- UTRA FDD inter-RAT cell reselection requirements specified in section 4.2.2.5.1 when the UTRA cell is of lower priority, and to verify the robustness of the UE measurement filtering in a fading environment. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

The test scenario comprises of one UTRA FDD and one E-UTRA FDD cells as given in tables A.4.3.1.3.1-1, A.4.3.1.3.1-2 and A.4.3.1.3.1-3. The test consists of four successive time periods, with time duration of T1 T2, T3 and T4 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.1.3.1-1: 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 Cell2	UE shall perform reselection to cell 1 during T1
CONGILION	Neighbour cell		Cell2	
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	
E-UTRA P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA A	Access Barring n	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2	T2		64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
Т3		S	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send preambles to cell 2
T4		S	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

Table A.4.3.1.3.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Parameter	Unit	Cell 1			
		T1	T2	T3	T4
E-UTRA RF Channel number		1	•	•	
BW _{channel}	10				
OCNG Patterns defined in A.3					
		OP.2 FD	DD		
PSS_RA	dB	0			
SSS_RA	dB	0			
PCFICH_RB	dB	0			
PHICH_RA	dB	0			
PHICH_RB	dB	0			
PDCCH_RA	dB	0			
PDCCH_RB	dB	0			
PDSCH_RA	dB	0			
PDSCH_RB	dB	0			
OCNG_RA ^{Note 1}	dB	0			
OCNG_RB ^{Note 1}	dB	0			
Qqualmin for UTRA neighbour		-20			
Qrxlevmin for UTRA neighbou	dBm	-115			
Qrxlevmin	dBm	-140			
N_{oc}	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82	-82	-107	-107
\hat{E}_{s}/I_{ot}	dB	22	22	-3	-3
\hat{E}_s/N_{oc}	dB	22	22	-3	-3
Treselection _{EUTRAN}	S	0			
Snonintrasearch	dB	Not sent			
Thresh _{serving, low}	dB	44			
Thresh _{x, low} (Note 2)	dB	42			
Propagation Condition		ETU70			

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

This refers to the value of Thresh_{x, low} which is included in E-UTRA system inforr Note 1:

Note 2: threshold for the UTRA target cell.

Table A.4.3.1.3.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)			
		T1	T2	T3	T4
UTRA RF Channel Number		Channel	2		
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
OCNS_Ec/lor	dB	-0.941			
\hat{I}_{or}/I_{oc}	dB	13	13	13	13
I_{oc}	dBm/3,84 MHz	-70			·
CPICH_Ec/lo	dB	-10.21	-10.21	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67	-67	-67
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	44			
Note 1: This refers to the value of Thresh _{x, high} which is included in UTRA system					

Note 1: 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

A.4.3.1.3.2 Test Requirements

The probability of reselection from cell 1to cell 2 during T2 observed during testing shall be less than 10%

The probability of reselection from cell 2 to cell 1 during T4 observed during testing shall be less than 10%

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

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

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

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

Where:

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 20.48 s for lower priority cell reselection, allow 21 s.

A.4.3.2 E-UTRAN FDD – UTRAN TDD:

A.4.3.2.1 Test Purpose and Environment

A.4.3.2.1.1 3.84Mcps TDD option

A.4.3.2.1.2 1.28Mcps TDD option

This test is to verify the requirement for the E-UTRA FDD to UTRA TDD inter-RAT cell reselection requirements specified in section 4.2.2.5.2 when the UTRA cell is of lower priority.

This test scenario comprised of 1 E-UTRA FDD serving cell (Cell 1), and 1 UTRA TDD cell (Cell 2) to be re-selected. Test parameters are given in table A.4.3.2.1.2-1, A.4.3.2.1.2-2, and A.4.3.2.1.2-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Cell 2 is of lower priority than cell 1.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Table A.4.3.2.1.2-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD OPTION) Cell Re-selection

Parai	meter	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	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	E-UTRA FDD cell
CP length of c	CP length of cell 1		normal	
E-UTRA PRA	E-UTRA PRACH		4	As specified in table 5.7.1-2 in TS 36.211
configuration				
Time offset be	etween cells		3 ms	Asynchronous cells
Access Barrin	g Information	-	Not	No additional delays in random access procedure.
			sent	
Treselection		S	0	
DRX cycle ler	ngth	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	

Table A.4.3.2.1.2-2: 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		1		
Number				
BW _{channel}	MHz	1	0	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RB	dB			
SSS_RB	dB			
PCFICH_PA	dB			
PHICH_PA	dB			
PHICH_PB	dB	0	0	
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	-6	98	
RSRP	dBm/15kHz	-87	-101	
\hat{E}_{s}/I_{ot}	dB	11	-3	
S _{nonintrasearch}	dB	Not sent		
Thresh _{serving, low}	dB	46 (-94dBm)		
Thresh _{x, low} (Note2)	dB	24 (-79dBm)		
Propagation Condition		AW	'GN	

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.

Note2: 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 A.4.3.2.1.2-3: 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		Dwl	PTS
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/lor	dB	-3	-3		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor	dB	-3	-3		
\hat{I}_{or}/I_{oc}	dB	11	11	11	11
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72	-72	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 (-9	4dBm)	

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: 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

A.4.3.2.1.3 7.68Mcps TDD option

A.4.3.2.1 Test Requirements

A.4.3.2.1.1 3.84Mcps TDD option

A.4.3.2.1.2 1.28Mcps TDD option

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

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

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

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, See table 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.

A.4.3.2.2.2.3 7.68Mcps TDD option

A.4.3.3 E-UTRAN TDD – UTRAN FDD:

A.4.3.3.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA TDD- UTRA FDD inter-RAT cell reselection requirements specified in section 4.2.2.5.1 when the UTRA cell is of lower priority.

The test scenario comprises of one UTRA FDD and one E-UTRA TDD cells as given in tables A.4.3.3.1-1, A.4.3.3.1-2 and A.4.3.3-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.3.1-1: General test parameters for EUTRA TDD- lower priority UTRA FDD inter RAT cell reselection 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	Active cells		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	
E-UTRA F	PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-dov	wnlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special sub	oframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
E_UTF	E_UTRA Access Barring		Not Sent	No additional delays in random access
	Information			procedure.
DR	XX cycle length	S	1.28	The value shall be used for all cells in the test.
	T1		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.

Table A.4.3.3.1-2: Cell specific test parameters for cell 1(E-UTRA)

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel		1		
number				
BW _{channel}	MHz		10	
OCNG Patterns defined in				
A.3.2.2.2 (OP.2 TDD)		OF	P.2 TDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB		_	
PHICH_RB	dB		0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB]		
OCNG_RB ^{Note 1}	dB			

Qqualmin for UTRA neighbour cell	dB	-20		
Qrxlevmin for UTRA neighbour cell	dBm	-115		
Qrxlevmin	dBm		-140	
N_{oc}	dBm/15 kHz	-98		
RSRP	dBm/15 KHz	-86	-102	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	12	-4	
\hat{E}_s/N_{oc}	dB	12	-4	
Treselection _{EUTRAN}	S	0		
Snonintrasearch	dB	Not sent		
Thresh _{serving, low}	dB	44		
Thresh _{x, low} (Note 2)	dB	42		
Propagation Condition		, A	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 $\mathsf{Thresh}_{\mathsf{x},\,\mathsf{low}}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.3.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2	(UTRA)
		T1	T2
UTRA RF Channel Number		Channel 2	2
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
OCNS_Ec/lor	dB	-0.941	
\hat{I}_{or}/I_{oc}	dB	13	13
I_{oc}	dBm/3,84 MHz	-70	
CPICH_Ec/Io	dB	-10.21	-10.21
CPICH_RSCP	dBm	-67	-67
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 1 : This refers to the va	lue of Thresh	high Which	is included

Note 1: 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

A.4.3.3.2 Test Requirements

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.

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

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

Where:

T_{evaluateUTRA-FDD} See Table 4.2.2.5.1-1

 $T_{SI\text{-}UTRA}$ 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 for lower priority cell reselection, allow 21 s.

A.4.3.4 E-UTRAN TDD – UTRAN TDD:

A.4.3.4.1 E-UTRA to UTRA TDD cell re-selection: UTRA is of higher priority

A.4.3.4.1.1 Test Purpose and Environment

A.4.3.4.1.1.1 3.84 Mcps TDD option

A.4.3.4.1.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the E-UTRA TDD to UTRA TDD inter-RAT cell re-selection requirements specified in section 4.2.2.5 when the UTRA cell is of higher priority.

This test scenario comprised of 1 E-UTRA TDD serving cell, and 1 UTRA TDD cell to be re-selected. Test parameters are given in table A.4.3.4.1.1.2-1, A.4.3.4.1.1.2-2, and A.4.3.4.1.1.2-3. The test consists of three successive time periods, with time duration 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. Cell 2 is of higher priority than cell 1.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Table A.4.3.4.1.1.2-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Para	meter	Unit	Value	Comment
Initial	Active cell		Cell 2	UE shall be forced to cell 2 in the initialisation phase, so that
condition				reselection to cell 1 occurs during the first T1 phase
T1 end	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-down configuration			1	As specified in table 4.2.2 in TS 36.211
Special subf configuration			6	As specified in table 4.2.1 in TS 36.211
PRACH con cell 1	figuration of		53	As specified in table 4.7.1-3 in TS 36.211
CP length of	cell 1		Normal	
Time offset b	oetween cells		3 ms	Asynchronous cells
Access Barr	ing	-	Not	No additional delays in random access procedure.
Information			sent	
T _{reselection}		S	0	
DRX cycle le	ength	S	1,28	
HCS			Not	
			used	
T1		S	25	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	>20	During T2, cell 2 shall be powered off, and during the off time the 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
Т3		S	85	T3 need to be defined so that cell re-selection reaction time is taken into account.

Table A.4.3.4.1.1.2-2: Cell specific test 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			1		
Number					
BW _{channel}	MHz		10		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RB	dB				
SSS_RB	dB				
PCFICH_PA	dB				
PHICH_PA	dB				
PHICH_PB	dB	0	0	0	
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	-87	-87	
\hat{E}_{s}/I_{ot}	dB	11	11	11	
Thresh _{x, high} (Note2)	dB	24(-79dBm)			
S _{nonintrasearch}	dB	46			
Propagation Condition		AWGN			

Note1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note2: This refers to the value of $\mathsf{Thresh}_{\mathsf{x},\,\mathsf{high}}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.4.1.1.2-3: Cell specific test 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)				Char	nel 2		
PCCPCH_Ec/lor	dB	-3	-3	-3			
DwPCH_Ec/lor	dB				0	0	0
OCNS_Ec/lor	dB	-3	-3	-3			
\hat{I}_{or}/I_{oc}	dB	-3	-inf	11	-3	-inf	11
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86	-inf	-72		n.a.	
Propagation Condition				AW	'GN		
Q _{rxlevmin}	dBm			-1	03		
Qoffset1 _{s,n}	dB			C1, (C2: 0		
Qhyst1 _s	dB	0					
S _{nonintrasearch}	dB	Not sent					
Thresh _{serving, low}	dB			24 (-7	9dBm)	•	•
Thresh _{x, low} (Note2)	dB			46 (-9	4dBm)	•	·

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: 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

A.4.3.4.1.1.3 7.68 Mcps TDD option

A.4.3.4.1.2 Test Requirements

A.4.3.4.1.2.1 3.84 Mpcs TDD option

A.4.3.4.1.2.2 1.28 Mpcs TDD option

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 the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

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

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as: $T_{higher_priority_search} + T_{evaluateUTRA_TDD} + T_{SI_UTRA}$,

Where:

 $T_{higher_priority_search}$ 60s, See section 4.2.2

T_{evaluateUTRA TDD} 19.2s, See Table 4.2.2.5.2-1

T_{SUUTRA} 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.

A.4.3.4.1.2.3 7.68 Mpcs TDD option

A.4.3.4.2 E-UTRA to UTRA TDD cell re-selection: UTRA is of lower priority

A.4.3.4.2.1 Test Purpose and Environment

A.4.3.4.2.1.1 3.84 Mcps TDD option

A.4.3.4.2.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the E-UTRA TDD to UTRA TDD inter-RAT cell re-selection requirements specified in section 4.2.2.5 when the UTRA cell is of lower priority.

This test scenario comprised of 1 E-UTRA TDD serving cell (Cell 1), and 1 UTRA TDD cell (Cell 2) to be re-selected. Test parameters are given in table A.4.3.4.2.1.2-1, A.4.3.4.2.1.2-2, and A.4.3.4.2.1.2-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. Cell 2 is of lower priority than cell 1.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Table A.4.3.4.2.1.2-1: General test parameters for E-UTRAN to UTRAN (1.28 Mcps TDD OPTION) Cell Re-selection

Parar	neter	Unit	Value	Comment
Initial	Active cell		Cell 2	UE shall be forced to cell 2 in the initialisation phase, so that
condition				reselection to cell 1 occurs during the first T1 phase
T1 end	Active cell		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	1.28 Mcps TDD OPTION cell
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	E-UTRA TDD cell
Uplink-downlink of cell 1	k configuration		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 configu			53	As specified in table 4.7.1-3 in TS 36.211
CP length of ce	ell 1		Normal	
Time offset bet	ween cells		3 ms	Asynchronous cells
Access Barring	Information	-	Not sent	No additional delays in random access procedure.
Treselection		S	0	
DRX cycle leng	jth	S	1,28	
HCS			Not	
			used	
T1		S	85	
T2		S	25	

Table A.4.3.4.2.1.2-2: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Се	II 1
		T1	T2
E-UTRA RF Channel		,	1
Number			
BW _{channel}	MHz	1	0
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB	0	0
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	-6	98
RSRP	dBm/15kHz	-87	-101
\hat{E}_{s}/I_{ot}	dB	11	-3
Snonintrasearch	dB	Not sent	
Thresh _{serving, low}	dB	46 (-94dBm)	
Thresh _{x, low} (Note2)	dB	24 (-79dBm)	
Propagation Condition		AW	'GN

Note1: OCNG shall be used such that cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note2: This refers to the value of $\mathsf{Thresh}_{\mathsf{x,\,low}}$ which is included in E-UTRA system information, and is a threshold for the UTRA target cell

Table A.4.3.4.2.1.2-3: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 2)

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Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0		Dwl	PTS
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)		Channel 2			
PCCPCH_Ec/lor	dB	-3	-3		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor	dB	-3	-3		
\hat{I}_{or}/I_{oc}	dB	11	11	11	11
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-72	-72	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 (-9	4dBm)	

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.

Note2: 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

A.4.3.4.2.1.3 7.68 Mcps TDD option

A.4.3.4.2.2 Test Requirements

A.4.3.4.2.2.1 3.84 Mpcs TDD option

A.4.3.4.2.2.2 1.28 Mpcs TDD option

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

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

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

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, 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 20.48 s, allow 21 s for lower priority cell reselection in the test case.

A.4.3.4.2.2.3 7.68 Mpcs TDD option

A.4.3.4.3 EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority

A.4.3.4.3.1 Test Purpose and Environment

This test is to verify the requirement for the EUTRA TDD- UTRA TDD inter-RAT cell reselection requirements specified in section 4.2.2.5.2 when the UTRA cell is of lower priority, and to verify the robustness of the UE measurement filtering in a fading environment. The E-UTRA cell is in fading propagation conditions and the UTRA cell is in AWGN propagation conditions.

The test scenario comprises of one UTRA TDD and one E-UTRA TDD cells as given in tables A.4.3.4.3.1-1, A.4.3.4.3.1-2 and A.4.3.4.3.1-3. The test consists of four successive time periods, with time duration of T1 T2, T3 and T4 respectively. Both E-UTRA cell 1 and UTRA cell 2 are already identified by the UE prior to the start of the test. Cell 2 is of lower priority than cell 1.

Table A.4.3.4.3.1-1: General test parameters for EUTRA TDD- lower priority UTRA TDD 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	Active cells		Cell1	UE shall perform reselection to cell 1 during T1
condition	Neighbour cell		Cell2	
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	
E-UTRA P	RACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-dov	vnlink configuration of		1	As specified in table 4.2.2 in TS 36.211
Special sul	bframe configuration of		6	As specified in table 4.2.1 in TS 36.211
E_UTRA A	access Barring	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1
T2		S	64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
ТЗ		S	<25	T3 need to be defined so that cell re-selection reaction time is taken into account. T3 is terminated when the UE starts to send PRACH preambles to cell 2
T4		S	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2

Table A.4.3.4.3.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Unit	Cell 1			
	T1	T2	Т3	T4
			1	
MHz		1	0	
		OP.2	TDD	
dB		()	
dB				
dBm		-1	03	
dBm		-1	40	
dBm/15 kHz		-1	04	
dBm/15 KHz	-82	-82	-107	-107
dB	22	22	-3	-3
dB	22	22	-3	-3
S	0			
dB	Not sent			
dB	44			
dB	24			
		ETI	J70	
	MHz dB	MHz MHz dB	MHz 1 dB dB dBm/15 kHz -1 dBm/15 KHz -82 -82 dB 22 22 s 0 0 dB Not 0 dB 4 4 dB 2 2	T1 T2 T3 MHz 10 OP.2 TDD dB 0 dB dB dB 0 dB 0 dB 0 dB 0 dB 0 dB 0 dB -103 dBm/15 kHz -104 dBm/15 kHz -82 -82 -107 dB 22 22 -3 dB 22 22 -3 s 0 0 dB Not sent 44 dB 24 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: 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 A.4.3.1.3.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)							
Timeslot Number			()		DwPTS			
		T1	T2	T3	T4	T1	T2	T3	T4
UTRA RF Channel Number (Note1)					Char	nnel 2			
PCCPCH_Ec/lor	dB		-	3					
DwPCH_Ec/lor	dB							0	
OCNS_Ec/lor	dB		-;	3					
\hat{I}_{or}/I_{oc}	dB	13	13	13	13	13	13	13	13
I_{oc}	dBm/1.28 MHz	-80							
PCCPCH RSCP	dBm	-70	-70	-70	-70	n.a.	n.a.	n.a.	n.a.
Propagation Condition					AW	'GN			
Qrxlevmin	dBm				-1	03			
Qrxlevmin _{EUTRA}	dBm	-140							
UE_TXPWR_MAX_RACH	dBm	21							
Treselection	S	0							
Thresh _{x, high} (Note2)	dB				4	4			

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's

channel number.

Note2: This refers to the value of $\mathsf{Thresh}_{x,\,\mathsf{high}}$ which is included in UTRA system information, and is a

threshold for the E-UTRA target cell

A.4.3.1.3.2 Test Requirements

The probability of reselection from cell 1 to cell 2 during T2 observed during testing shall be less than 10%

The probability of reselection from cell 2 to cell 1 during T4 observed during testing shall be less than 10%

The cell reselection delay to lower priority is defined as the time from the beginning of time period T3, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequene in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2. In order to evaluate reselection delay, the system simulator first needs to verify that the UE is camped on cell 1 at the start of T3

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

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

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, 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 20.48 s for lower priority cell reselection, allow 21 s.

A.4.4 E-UTRAN to GSM Cell Re-Selection

A.4.4.1 E-UTRAN FDD – GSM:

A.4.4.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to GSM cell re-selection delay reported in section 4.2.2.5.

This scenario implies the presence of 1 E-UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 E-UTRA carrier and 12 GSM cells. Test parameters are given in Table, A.4.4.1-1, A.4.4.1-2, A.4.4.1-3. E-UTRA FDD cell (Cell 1) and GSM cell (cell 2) shall belong to different Location Areas. The test comprises two successive time periods, T1 and T2. During initialization before the start of the test, the UE is camped on cell 1. 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 reselection criterion during T1. At the start of T2, the signal levels change such that cell 2 satisfies reselection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA FDD layer.

Table A.4.4.1-1: General test parameters for E-UTRA 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 RI	F Channel Number	hannel Number 1		1 E-UTRA FDD carrier frequency
GSM ARFO	GSM ARFCN		1	12 GSM BCCH carriers are used
PRACH co	PRACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
Access Bar	rring 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.
Propagatio	n channel		AWGN	

Table A.4.4.1-2: Cell-specific test parameters for Cell 1 – E-UTRA FDD cell

Parameter	Unit		Cell 1
		T1	T2
E-UTRA RF Channel			1
number			
BW _{channel}	MHz		10
OCNG Patterns defined in			
A.3.2.1.1 (OP.2 FDD)		OF	P.2 FDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		_
PHICH_RB	dB		0
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	-102
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	9	-4
\hat{E}_s/N_{oc}	dB	9 -4	
TreselectionEUTRAN	S		0
S _{nonintrasearch}	dB	N	ot 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 A.4.4.1-3: Cell-specific test parameters for Cell 2 – GSM cell

Parameter	Unit	Cell 2	(GSM)
rarameter	Offic	T1	T2
Absolute RF Channel Number		ARFCN	1
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

A.4.4.1.2 Test Requirements

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 shall be less than $26 \text{ s} + T_{BCCH}$, where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [8].

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

NOTE: The cell re-selection delay can be expressed as: $4*T_{measureGSM} + T_{BCCH}$, where:

 $T_{measureGSM}$ See Table 4.2.2.5.3-1 in section 4.2.2.5.3.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [8].

According to [8], the maximum time allowed to read the BCCH data, when being synchronized to

a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH} , allow 26 s + T_{BCCH} in the test case.

A.4.4.2 E-UTRAN TDD – GSM:

A.4.4.2.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to GSM cell re-selection delay reported in section 4.2.2.5.

This scenario implies the presence of 1 E-UTRAN serving cell, and 1 GSM cell to be re-selected. The UE is requested to monitor neighbouring cells on 1 E-UTRA carrier and 12 GSM cells. Test parameters are given in Table, A.4.4.2-1, A.4.4.2-2, A.4.4.2-3. E-UTRA TDD cell (Cell 1) and GSM cell (cell 2) shall belong to different Location Areas. The test comprises two successive time periods, T1 and T2. During initialization before the start of the test, the UE is

camped on cell 1. 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 reselection criterion during T1. At the start of T2, the signal levels change such that cell 2 satisfies reselection criterion. The GSM layer is configured at a lower priority than the serving E-UTRA TDD layer.

Table A.4.4.2-1: 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 R	F Channel Number		1	1 E-UTRA TDD carrier frequency
GSM ARFO	CN		1	12 GSM BCCH carriers are used
Uplink-dow cell 1	nlink configuration of		1	As specified in table 4.2.2 in TS 36.211
Special sub for cell 1	oframe configuration		6	As specified in table 4.2.1 in TS 36.211
PRACH co	nfiguration for cell 1		53	As specified in table 5.7.1-3 in TS 36.211
CP length	of cell 1		Normal	
Access Ba	rring 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	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.
Propagatio	n channel		AWGN	

Table A.4.4.2-2: Cell-specific test parameters for Cell 1 – E-UTRA TDD cell

Parameter	Unit		Cell 1
		T1	T2
E-UTRA RF Channel			1
number			
BW _{channel}	MHz		10
OCNG Patterns defined in			
A.3.2.1.1 (OP.2 TDD)		O	P.2 TDD
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		_
PHICH_RB	dB		0
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	-102
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	9	-4
\hat{E}_s/N_{oc}	dB	9	-4
TreselectionEUTRAN	S		0
S _{nonintrasearch}	dB	N	ot 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 A.4.4.2-3: Cell-specific test parameters for Cell 2 - GSM cell

Parameter	Unit	Cell 2 (GSM)		
Parameter	Offic	T1	T2	
Absolute RF Channel Number		ARFCN ²	1	
RXLEV	dBm	-90	-75	
RXLEV_ACCESS_MIN	dBm	-105		
MS_TXPWR_MAX_CCH	dBm	24		

A.4.4.2.2 Test Requirements

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 shall be less than $26 \text{ s} + T_{BCCH}$, where T_{BCCH} is the maximum time allowed to read BCCH data from GSM cell [8].

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

NOTE: The cell re-selection delay can be expressed as: $4*T_{measureGSM} + T_{BCCH}$, where:

 $T_{measureGSM}$ See Table 4.2.2.5.3-1 in section 4.2.2.5.3.

T_{BCCH} Maximum time allowed to read BCCH data from GSM cell [8].

According to [8], the maximum time allowed to read the BCCH data, when being synchronized to

a BCCH carrier, is 1.9 s.

This gives a total of 25.6 s + T_{BCCH} , allow 26 s + T_{BCCH} in the test case.

A.4.5 E-UTRAN to HRPD Cell Re-Selection

A.4.5.1 E-UTRAN FDD – HRPD

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

A.4.5.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD- HRPD inter-RAT cell reselection requirements specified in section 4.2.2.5.4 when the HRPD cell is of lower priority.

The test scenario comprises of one HRPD and one E-UTRAN FDD cells as given in tables A.4.5.1.1.1-1, A.4.5.1.1.1-2 and A.4.5.1.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN FDD cell 1 and HRPD cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.5.1.1.1-1: General Test Parameters for E-UTRAN FDD - lower priority HRPD Cell Reselection

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

Table A.4.5.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cel	Cell 1			
		T1	T2			
E-UTRA RF Channel number		1				
BW _{channel}	MHz	10)			
OCNG Patterns defined in A.3.2.1.1						
(OP.2 FDD)		OP.2	FDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
	-ID /4.5. Lil I	0.	<u> </u>			
N_{oc}	dBm/15 kHz	-98	3			
RSRP	dBm/15 KHz	-89	-100			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	9	-2			
\hat{E}_s/N_{oc}	dB	9	-2			
Treselection _{EUTRAN}	S	0				
Snonintrasearch	dB	Not s	ent			
cellReselectionPriority	-	1				
Qrxlevmin	dBm	-14	.0			
Qrxlevminoffset	dB	0				
Pcompensation	dB	0				
S _{ServingCell}	dB	51	40			
Thresh _{serving, low}	dB	43	3			
Propagation Condition		AWO	GN			

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

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

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

A.4.5.1.1.2 Test Requirements

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

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

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

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

Where:

T_{evaluatHRPD} See Table 4.2.2.5.4-1

T_{SI-HRPD} Maximum repetition period of relevant system information blocks that need to be received

by the UE to camp on cell 2; 1704 ms is assumed in this test case.

This gives a total of 20.904 s for the lower priority cell reselection, allow 21 s in the test case.

A.4.6 E-UTRAN to cdma2000 1X Cell Re-Selection

A.4.6.1 E-UTRAN FDD – cdma2000 1X

A.4.6.1.1 E-UTRAN FDD – cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority

A.4.6.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD- cdma2000 1X inter-RAT cell reselection requirements specified in section 4.2.2.5.5 when the cdma2000 1X cell is of lower priority.

The test scenario comprises of one cdma2000 1X and one E-UTRAN FDD cells as given in tables A.4.6.1.1.1-1, A.4.6.1.1.1-2 and A.4.6.1.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN FDD cell 1 and cdma2000 1X cell 2 are already identified by the UE prior to the start of the test. At T1 the UE is camped on to cell 1. Cell 2 is of lower priority than cell 1. Cell 1 and cell 2 shall belong to different tracking areas.

Table A.4.6.1.1.1-1: General Test Parameters for E-UTRAN FDD - lower priority cdma2000 1X Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbour cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell is selecting during T2
DRX cycle length		S	1.28	during 12
E-UTRA FDD RF		1	Only one FDD carrier frequency is used.	
E-UTRA FDD Cha	nnel Bandwidth (BW _{channel})	MHz	10	
cdma2000 1X RF	Channel Number		1	Only one cdma2000 1X carrier frequency is used.
E-UTRA FDD PRA		4	As specified in table 5.7.1-2 in TS 36.211	
E_UTRA FDD Acc	-	Not Sent	No additional delays in random access procedure.	
T1	S	30		
T2		S	30	

Table A.4.6.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel number		1			
BW _{channel}	MHz	1()		
OCNG Patterns defined in A.3.2.1.1					
(OP.2 FDD)		OP.2	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	_			
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-9	8		
RSRP Note 3	dBm/15 KHz	-89	-100		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	9	-2		
\hat{E}_s/N_{oc}	dB	9	-2		
Treselection _{EUTRAN}	S	Ö			
Snonintrasearch	dB	Not s	sent		
cellReselectionPriority	-	1			
Qrxlevmin	dBm	-14	10		
Qrxlevminoffset	dB	0			
Pcompensation	dB	0	·		
SservingCell	dB	51	40		
Thresh _{serving, low}	dB	43	3		
Propagation Condition		AW	GN		
NI (4 ONO I III I I I III					

Note 1: CNG 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: Iterference 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: SRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

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

Table A.4.6.1.1.1-3: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

A.4.6.1.1.2 Test Requirements

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

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

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

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

Where:

 $T_{evaluatcdma2000\;1X} \qquad \quad See\; Table\; 4.2.2.5.5\text{-}1$

T_{SI-cdma2000 1X} Maximum repetition period of relevant system information blocks that need to be received by

the UE to camp on cell 2; 1280 ms is assumed in this test case.

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

A.5 E-UTRAN RRC CONNECTED Mode Mobility

A.5.1 E-UTRAN Handover

A.5.1.1 E-UTRAN FDD - FDD Intra frequency handover

A.5.1.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency handover requirements specified in section 5.1.2.1.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.5.1.1.1-1 and A.5.1.1.1-2. 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.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.1.1-1: General test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter		Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement	As specified in section A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chanr			1	Only one FDD carrier frequency is used.
Channel Bandwidth	า (BW _{channel})	MHz	10	
A3-Offset		dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells			3 ms	Asynchronous cells
T1	T1		5	
T2		S	≤5	
T3		S	1	

Table A.5.1.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	Т3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD	FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB					•		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36	
N_{oc} Note 2	dBm/15 KHz				-98			
\hat{E}_s/N_{oc}	dB	8	8	8	- Infinity	11	11	
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87	
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.

A.5.1.1.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in section 11.2 in [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in section 5.1.2.1.2.

This gives a total of 50 ms.

A.5.1.2 E-UTRAN TDD - TDD Intra frequency handover

A.5.1.2.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD intra frequency handover requirements specified in section 5.2.2.4.

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 test scenario comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables A.5.1.2.1-1 and A.5.1.2.1-2. 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.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. T3 is defined as the end of the last TTI containing the RRC message implying handover.

Table A.5.1.2.1-1: General test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter		Unit	Value	Comment
			DL Reference Measurement	
PDSCH parameters	S		Channel R.0 TDD	As specified in section A.3.1.1.2
·			DL Reference Measurement	·
PCFICH/PDCCHPI	HICH parameters		Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth	(BW _{channel})	MHz	10	
A3-Offset	<u> </u>	dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
Special subframe c	onfiguration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink cor	nfiguration		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			3 μs	Synchronous cells
T1		s	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	Т3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD
defined in A.3.2.1.1		TDD	TDD	TDD			
(OP.1 TDD) and in							
A.3.2.1.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB		_			_	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
\hat{E}_{s}/I_{ot}	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
Note 2	dBm/15 KHz				-98		
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87
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.

A.5.1.2.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 15 ms and is specified in section 11.2 in [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in section 5.2.2.4.2.

This gives a total of 50 ms.

A.5.1.3 E-UTRAN FDD – FDD Inter frequency handover

A.5.1.3.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD inter-frequency handover requirements specified in section 5.1.2.1.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.5.1.3.1-1 and A.5.1.3.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3

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_{ac} to be fulfilled.

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

respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.3.1-1: General test parameters for E-UTRAN FDD-FDD Inter frequency handover test case

Para	ameter	Unit	Value	Comment
PDSCH parameter	'S		DL Reference Measurement	As specified in section A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF chann	el number		1, 2	Two FDD carriers are used
Channel Bandwidth	n (BW _{channel})	MHz	10	
A3-Offset		dB	-4	
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			DRX_L	As specified in section A.3.3
PRACH configurati	ion		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring Info	ormation	-	Not sent	No additional delays in random
_				access procedure
Time offset between	en cells		3 ms	Asynchronous cells
Gap pattern configuration Id			0	As specified in Table 8.1.2.1-1
-				started before T2 starts
T1	T1		5	
T2	·	S	≤5	
T3		S	1	

Table A.5.1.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD Inter frequency handover test case

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	Т3	T1	T2		Т3
E-UTRA RF Channel			1			2		
number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2 FDD	OP.2	OP.2 FDD	C	P.1 FDD
defined in A.3.2.1.1		FDD	FDD		FDD			
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
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	4	4	-Infinity	y 7		7
Note 2	dBm/15 kHz			<u>.</u>	-98	•		
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	y 7		7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	y -91		-91
Propagation Condition			•		AWGN	•		•

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

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

A.5.1.3.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in section 11.2 in [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in section 5.1.2.1.2.

This gives a total of 50 ms.

A.5.1.4 E-UTRAN TDD – TDD Inter frequency handover

A.5.1.4.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-TDD intra frequency handover requirements specified in section 5.2.2.4.

The test scenario comprises of 1 E-UTRA TDD carrier and 2 cells as given in tables Table A.5.1.4.1-1 and Table A.5.1.4.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would not enter

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.

the DRX state. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE may not have any timing information of cell 2.

E-UTRAN shall send a RRC message implying handover to cell 2. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event A3.

Table A.5.1.4.1-1: General test parameters for E-UTRAN TDD-TDD Inter frequency handover test case

Para	Parameter		Value	Comment
			DL Reference Measurement	
PDSCH parameters			Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/	PHICH		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Gap Pattern Id			1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
E-UTRA RF chan	nel number		1, 2	Two TDD carriers are used
Channel Bandwid	th (BW _{channel})	MHz	10	
A3-Offset	,	dB	-4	
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
DRX			DRX_L	As specified in section A.3.3
CP length			Normal	
Access Barring In	formation	-	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 c	onfiguration		1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Time offset between cells			3 μs	Synchronous cells
T1		S	5	
T2		S	≤5	
T3		S	1	

Table A.5.1.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Inter frequency handover test case

Parameter	Unit		Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			2		
number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2 FDD	OP.2	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD		FDD			
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
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							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{oc}}$	dB	4	4	4	-Infinity	7	7	
$N_{oc}^{ m Note~2}$	dBm/15 kHz				-98			
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-infinity	-91	-91	
Propagation Condition			•		AWGN	•	•	

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

A.5.1.4.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms and is specified in section 11.2 in [2].

 $T_{interrupt} = 35$ ms in the test; $T_{interrupt}$ is defined in section 5.2.2.4.2.

This gives a total of 50 ms.

A.5.1.5 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell

A.5.1.5.1 Test Purpose and Environment

This test is to verify the FDD-FDD inter-frequency handover requirements for the case when the target cell is unknown as specified in section 5.1.2.1.

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_{ac} to be fulfilled.

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

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.5.1.5.1-1 and A.5.1.5.1-2. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and start to transmit the PRACH to Cell 2.

A RRC message implying handover shall be sent to the UE during period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.5.1-1: General test parameters for the E-UTRAN FDD-FDD Inter frequency handover test case when the target cell is unknown

Para	ameter	Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement	As specified in section A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF chann	el number		1, 2	Two FDD carriers are used
Channel Bandwidth	n (BW _{channel})	MHz	10	
DRX			OFF	Non-DRX test
PRACH configurati	on		4	As specified in table 5.7.1-2 in
				3GPP TS 36.211
Access Barring Info	ormation	-	Not sent	No additional delays in random
	-			access procedure
Time offset betwee	Time offset between cells		3 ms	Asynchronous cells
T1		S	≤5	
T2		S	1	

Table A.5.1.5.1-2: Cell specific test parameters for the E-UTRAN FDD-FDD Inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cel	1	Cell 2		
		T1 T2		T1 T2		
E-UTRA RF Channel		1		2		
number						
BW _{channel}	MHz	10)	10		
OCNG Patterns		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1						
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
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	4	-Infinity	7	
Note 2	dBm/15 kHz			-98		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-91	
Propagation Condition		AWGN				

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

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over

subcarriers and time and shall be modelled as AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.

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

A.5.1.5.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 130 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms, which is specified in section 11.2 in [2].

 $T_{interrupt}$ = 115 ms in the test. See section 5.1.2.1.2

This gives a total of 130 ms.

A.5.1.6 E-UTRAN TDD – TDD Inter frequency handover; unknown Target Cell

A.5.1.6.1 Test Purpose and Environment

This test is to verify the TDD-TDD inter-frequency handover requirements for the case when the target cell is unknown as specified in section 5.2.2.4.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables A.5.1.6.1-1 and A.5.1.6.1-2. No gap patterns are configured in the test case. The test consists of two successive time periods, with time durations of T1, T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE.

Table A.5.1.6.1-1: General test parameters for the E-UTRAN TDD-TDD Inter-Frequency handover test case when the target cell is unknown

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.2.2.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.2.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF channe	el number		1, 2	Two TDD carriers
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Time offset between cells			3 μs	Synchronous cells
Gap pattern configuration			-	No gap pattern configured
T1		S	≤5	
T2		s	1	

Table A.5.1.6.1-2: Cell specific test parameters for the E-UTRAN TDD-TDD Inter frequency handover test case when the target cell is unknown

Parameter	Unit	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW _{channel}	MHz	1	0		10	
OCNG Patterns		OP.1 TDD	OP.2 TDD	OP.2 TDD	OP.1 TDD	
defined in A.3.2.2.1						
(OP.1 TDD) and in						
A.3.2.2.2 (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	
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98				
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	5	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	5	
Propagation Condition		AWGN				

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be
- Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.5.1.6.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 130 ms from the beginning of time period T2. The rate of correct handovers observed during repeated tests shall be at least 90%.

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 15 ms, which is specified in section 11.2 in [2].

 $T_{interrupt}$ = 115 ms in the test. See section 5.2.2.4.2

This gives a total of 130 ms.

A.5.2 E-UTRAN Handover to other RATs

A.5.2.1 E-UTRAN FDD – UTRAN FDD Handover

A.5.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to UTRAN FDD handover requirements specified in section 5.3.1.

The test parameters are given in Tables A.5.2.1.1-1, A.5.2.1.1-2 and A.5.2.1.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.2.1.1-1: General test parameters for E-UTRAN FDD to UTRAN FDD handover test case

PDSCH parameters			DL Reference Measurement	As specified in section A.3.1.1.1	
PDSCH parameters			Channel R.0 FDD	As specified in Section A.3.1.1.1	
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1	
Initial conditions Ac	tive cell		Cell 1	E-UTRAN cell	
	eighbouring cell		Cell 2	UTRAN cell	
	tive cell		Cell 2	UTRAN cell	
Channel Bandwidth (B	W _{channel})	MHz	10		
Gap Pattern Id	•		0	As specified in Table 8.1.2.1-1 started before T2 starts	
E-UTRAN FDD measu	rement quantity		RSRP		
Inter-RAT (UTRAN FDD) measurement quantity			CPICH Ec/N0		
b2-Threshold1		dBm	-91	Absolute E-UTRAN RSRP	
				threshold for event B2	
b2-Threshold2-UTRA		dB	-18	Absolute UTRAN CPICH Ec/N0 threshold for event B2	
Hysteresis		dB	0		
TimeToTrigger		S	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		

Table A.5.2.1.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRA)				
		T1 T2 T3		Т3		
E-UTRA RF Channel			1			
number						
BW _{channel}	MHz	10				
OCNG Patterns		OP.1	OP.1	OP.2		
defined in A.3.2.1.1		FDD	FDD	FDD		
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB]				
PHICH_RA	dB	1				
PHICH_RB	dB	0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB	1				
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB	1				
OCNG_RB ^{Note 1}	dB]				
\hat{E}_s/I_{ot}	dB	0 0 0		0		
N_{oc}	dBm/15 kHz	-98				
\hat{E}_s/N_{oc}	dB	0 0 0		0		
RSRP	dBm/15 KHz	-98 -98 -98		-98		
Propagation Condition			AWGN			
Note 1: OCNG shall be used such that both cells are fully allocated and a						

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

Table A.5.2.1.1-3: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 2)

Parameter	Unit	Unit Cell 2 (UTRA)				
		T1	T2	Т3		
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
DCH_Ec/lor	dB	N/A	N/A	Note 1		
OCNS_Ec/lor	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	-70	-70		
CPICH_Ec/Io	dB	-infinity	-14	-14		
Propagation Condition		AWGN				
Note 4. The DDOLLIe and in controlled by the message and falled						

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}.

A.5.2.1.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in section 5.3.1.1.1.

 $T_{interrupt} = 140$ ms in the test; $T_{interrupt}$ is defined in section 5.3.1.1.2.

This gives a total of 190 ms.

A.5.2.2 E-UTRAN TDD - UTRAN FDD Handover

A.5.2.2.1 Test Purpose and Environment

This test is to verify the E-UTRAN TDD – UTRAN FDD handover requirements specified in section 5.3.1.

The test scenario comprises of one E-UTRAN TDD cell and one UTRAN FDD cell as given in the tables A.5.2.2.1-1, A5.2.2.1-2 and A.5.2.2.1-3. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. At start of time duration T1, the UE does not have any timing information of cell 2. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before the start of T2 to enable the monitoring of UTRAN FDD. A neighbouring cell list, including the UTRAN cell (cell2), shall be sent to the UE before T2 starts. During the time T2 cell 2 becomes detectable and the UE is expected to detect and send the measurement report. A RRC message implying handover shall be sent to the UE during T2, after the UE has reported event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.2.2.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD handover

Par	ameter	Unit	Value	Comment
PDSCH paramete	ers (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
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 o	configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1
E-UTRAN TDD m	neasurement quantity		RSRP	
quantity	FDD) measurement		CPICH Ec/Io	
b2-Threshold1	b2-Threshold1		-91	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-U	b2-Threshold2-UTRA		-18	UTRAN FDD CPICH Ec/lo 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 confi	guration Id		0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Char	nnel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel (BW _{channel})	Bandwidth	MHz	10	
UTRA RF Channe	el 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	

Table A.5.2.2.1-2: Cell specific test parameters for E-UTRAN TDD (cell 1) for handover to UTRAN FDD (cell # 2)

Parameter	Unit		Cell 1 (E-UTRAN)	I (E-UTRAN)		
		T1	T2	T3		
E-UTRA RF Channel			1			
Number						
BW _{channel}	MHz		10			
OCNG Pattern defined						
in A.3.2.2.1 (OP.1 TDD)		OP	1 TDD	OP.2 TDD		
and in A.3.2.2.2 (OP.2		OF.	טטוו	OF.2 100		
TDD)						
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB	dB		0			
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA ^{Note 1}						
OCNG_RB ^{Note 1}						
RSRP	dBm/15 kHz	-98	-98	-98		
\hat{E}_{s}/I_{ot}	dB	0	0	0		
L _s / L _{ot}						
\hat{E}_s/N_{oc}	dB	0	0	0		
s/ · · oc						
N_{oc}	dBm/15 kHz	-98				
Propagation Condition			AWGN			
Note 1: OCNG shall be used such that the cell is fully allocated and a constant total transmitted						

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

Table A.5.2.2.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

Parameter	Unit	Ce	II 1 (UTR	A)	
		T1	T2	Т3	
CPICH_Ec/lor	dB		-10		
PCCPCH_Ec/lor	dB		-12		
SCH_Ec/lor	dB		-12		
PICH_Ec/lor	dB		-15		
DPCH_Ec/lor	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/lo	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} .					

A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 50 ms, which is specified in section 5.1.1.1.1.

 $T_{interrupt} = 140$ ms in the test; $T_{interrupt}$ is defined in section 5.3.1.1.2.

This gives a total of 190 ms.

A.5.2.3 E-UTRAN FDD- GSM Handover

A.5.2.3.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN to GSM cell handover delay specified in section 5.3.3.

The test parameters are given in Table A.5.2.3.1 -1, A.5.2.3.1 -2 and A.5.2.3.1 -3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 shall be used. The test consists of three successive time periods, with time duration 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 period T2, after the UE has reported Event B1. The start of T3 is defined as the end of 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 should be sent for the parameters specified in Table A.5.2.3.1 -1.

Table A.5.2.3.1 -1: General test parameters for E-UTRAN FDD-GSM handover

Para	meter	Unit	Value	Comment
PDSCH paramete	PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/ parameters	PHICH		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Gap Pattern Id			1	As specified in TS 36.133 section8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Inter-RAT measu	rement quantity		GSM Carrier RSSI	
Threshold other s	ystem	dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient	Filter coefficient		0	L3 filtering is not used
DRX				OFF
T1		S	20	
T2	_	S	7	
T3		S	1	

Table A. A.5.2.3.1 - 2: Cell Specific Parameters for Handover from E- UTRAN FDD to GSM cell case (cell 1)

Parameter	Unit	Cell 1				
		T1, T2	T3			
BW _{channel}	MHz	10				
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD			
PBCH_RA	dB					
PBCH_ RB	dB					
PSS_ RA	dB					
SSS_ RA	dB					
PCFICH_ RB	dB					
PHICH_ RA	dB					
PHICH_ RB	dB	0				
PDCCH_ RA	dB					
PDCCH_ RB	dB					
PDSCH_ RA	dB					
PDSCH_ RB	dB					
OCNG_ RA Note1	dB					
OCNG_ RB Note1	dB					
$\hat{ extbf{E}}_{ ext{s}}/ extbf{I}_{ ext{ot}}$	dB	4				
N_{oc} Note 2	dBm/15 kHz	-98 (AWGN)				
\hat{E}_s/N_{oc}	dB	4				
RSRP Note 3	dBm/15kH z	-94				
Propagation Condition		AWGN				
	Note 1: OCNG shall be used such that cell 1 is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as						
AWGN of appropriate power for N_{oc} to be fulfilled.						
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

Table A.5.2.3.1 - 3: Cell Specific Parameters for Handover from E-UTRAN FDD to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)		
Farameter	Oilit	T1	T2, T3	
Absolute RF Channel		ARFCN 1		
Number		ANICHI		
RXLEV	dBm	-85	-75	

A.5.2.3.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 100 ms from the beginning of time period T3.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay} = 90 \text{ ms} (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}$

 T_{offset} : Equal to 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}: Equal to 4.65 ms, the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 99.3 ms, allow 100 ms in the test case.

A.5.2.4 E-UTRAN TDD - UTRAN TDD Handover

A.5.2.4.1 Test Purpose and Environment

A.5.2.4.1.1 3.84 Mcps TDD option

A.5.2.4.1.2 1.28 Mcps TDD option

This test is to verify the requirement for E-UTRAN TDD to UTRAN TDD handover requirements specified in section 5.3.2.

The test scenario comprises of 1 E-UTRA TDD cell and 1 UTRA TDD cell as given in tables Table A.5.2.4.1.2-1, Table A.5.2.4.1.2-2, and Table A.5.2.4.1.2-3. Gap pattern configuration #0 as defined in table 8.1.2.1-1 is provided.

The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively.

E-UTRAN shall send a RRC message implying handover to UE. The RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The end of the last TTI containing handover message is begin of T3 duration.

Table A.5.2.4.1.2-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) handover test case

Parameter	Parameter		Val	ue	Comment	
PDSCH parame	ters		DL Reference		As specified in section A.3.1.1.2	
			Channel R.0 TD	<u>D</u>		
PCFICH/PDCCF	I/PHICH		DL Reference	Measurement	As specified in section A.3.1.2.2	
parameters			Channel R.6 TD	D		
Initial	Active cell		Cell 1		E-UTRA TDD cell	
conditions	Neighbour cell		Cell 2		UTRA 1.28Mcps TDD Cell	
Final	Active cell		Cell 2			
conditions						
Gap Pattern Id	Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.	
Uplink-downlink cell 1	configuration of		1		As specified in table 4.2.2 in TS 36.211	
Special subfram of cell 1	Special subframe configuration of cell 1		6		As specified in table 4.2.1 in TS 36.211	
CP length of cell	CP length of cell 1		Normal	_		
Time offset betw	Time offset between cells		3 ms		Asynchronous cells	
Access Barring I	nformation		Not Sent		No additional delays in random access procedure.	

Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Ofn	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	

Table A.5.2.4.1.2-2: Cell specific test parameters for E-UTRA TDD to UTRA TDD handover test case (cell 1)

Parameter	Unit	Cell 1		
		T1	T2	Т3
E-UTRA RF Channel			1	
Number				
BW _{channel}	MHz		10	
OCNG Pattern defined in				
A.3.2.2.1 (OP.1 TDD)		OP 1	TDD	OP.2
and in A.3.2.1.2 (OP.2		01.1	100	TDD
TDD)			ı	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RB	dB			
SSS_RB	dB			
PCFICH_PA	dB			
PHICH_PA	dB			
PHICH_PB	dB	0	0	0
PDCCH_PA	dB			
PDCCH_PB	dB			
PDSCH_PA	dB			
PDSCH_PB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	11	-3	-3
\hat{E}_s/N_{oc}	dB	11	-3	-3
N_{oc}	dBm/15kHz		-98	
RSRP	dBm/15kHz	-87	-101	-101
SCH_RP	dBm/15 kHz	-87	-101	-101
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.

Table A.5.2.4.1.2-3: Cell specific test parameters for cell search E-UTRA to UTRA case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number*	Channel 2						
PCCPCH_Ec/lor	dB		-3				
DwPCH_Ec/lor	dB				0		
OCNS_Ec/lor	dB	-3					
\hat{I}_{or}/I_{oc}	dB	-3	11	11	-3	11	11
I_{oc}	dBm/1.28 MHz			-8	30		
PCCPCH RSCP	dBm	-86	-72	-72		n.a.	
Propagation Condition		AWGN					
	of multi-frequency's	•			F Char	nel Nu	mber

A.5.2.4.1.3 7.68 Mcps TDD option

A.5.2.4.2 Test Requirements

A.5.2.4.2.1 3.84 Mcps TDD option

A.5.2.4.2.2 1.28 Mcps TDD option

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 90 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in section 5.3.2.2.1.

 $T_{interrupt} = 40$ ms in the test; $T_{interrupt}$ is defined in section 5.3.2.2.2.

This gives a total of 90 ms.

A.5.2.4.2.3 7.68 Mcps TDD option

A.5.2.5 E-UTRAN FDD – UTRAN TDD Handover

A.5.2.5.1 Test Purpose and Environment

A.5.2.5.1.1 3.84 Mcps TDD option

A.5.2.5.1.2 1.28 Mcps TDD option

This test is to verify the requirement for the E-UTRAN FDD to UTRAN TDD handover requirements specified in section 5.3.2.

The test scenario comprises of two cells, E-UTRA TDD cell1 and UTRA TDD cell2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #1 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring. The test parameters are given in Tables A.5.2.5.1-1, A.5.2.5.1-2 and A.5.2.5.1-3.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.2.5.1.2-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD option) handover test case

Parar	neter	Unit	Value	Comment
PDSCH paramete	rs		DL Reference Measurement	As specified in section
			Channel R.0 FDD	A.3.1.1.1
PCFICH/PDCCH/	PHICH		DL Reference Measurement	As specified in section
parameters			Channel R.6 FDD	A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRA FDD cell
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			1	As specified in 3GPP TS
				36.133 section 8.1.2.1.
E-UTRAN FDD m	easurement		RSRP	
quantity				
UTRAN TDD mea	surement		RSCP	
quantity				
CP length of cell 1			Normal	
Access Barring Inf	formation		Not Sent	No additional delays in random access procedure.
Hysteresis		dB	0	·
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Thresh1		dBm	-94	Absolute E-UTRAN RSRP
				threshold for event B2
Thresh2	Thresh2		-79	Absolute UTRAN RSCP
				threshold for event B2
T1	T1		5	
T2		S	≤ 10	
T3	T3		1	

Table A.5.2.5.1.2-2: Cell specific test parameters for E-UTRAN FDD to UTRAN (1.28 Mcps TDD option) handover test case (cell 1)

Parameter Unit			Cell 1 (E-UTF	RA)
		T1	T2	T3
E-UTRA RF Channel			1	
number				
BW _{channel}	MHz		10	
OCNG Patterns		OP.1 FDD	OP.1 FDD	OP.2
defined in A.3.2.1.1				FDD
(OP.1 FDD) and in				
A.3.2.1.2 (OP.2 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB		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/N_{oc}	dB	11	-3	-3
N oc	dBm/15 kHz		-98	
\hat{E}_s/I_{ot}	dB	11	-3	-3
RSRP	dBm/15 KHz	-87	-101	-101
Propagation Condition			AWGN	
Note 1: OCNG shall be u	sed such that bot	h cells are fu	lly allocated an	d a constant

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

Table A.5.2.5.1.2-3: Cell specific test parameters for E-UTRAN FDD to UTRAN (1.28 Mcps TDD option) handover test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0			DwPTS		1
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number*		Channel 2					
PCCPCH_Ec/lor	dB		-3				
DwPCH_Ec/lor	dB				0		
OCNS_Ec/lor	dB	-3					
\hat{I}_{or}/I_{oc}	dB	-3	11	11	-3	11	11
I_{oc}	dBm/1.28 MHz	-80					
PCCPCH RSCP	dBm	-86 -72 -72 n.a.					
Propagation Condition		AWGN					
* Note: In the case of multi-frequency cell, the UTRA RF Channel Number is							

In the case of multi-frequency cell, the UTRA RF Channel Number in the primary frequency's channel number.

A.5.2.5.1.3 7.68 Mcps TDD option

A.5.2.5.2 Test Requirements

A.5.2.5.2.1 3.84 Mcps TDD option

A.5.2.5.2.2 1.28 Mcps TDD option

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 90 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrupt}$, where:

RRC procedure delay = 50 ms, which is specified in section 5.3.2.2.1.

 $T_{interrupt} = 40$ ms in the test; $T_{interrupt}$ is defined in section 5.3.2.2.2.

This gives a total of 90 ms.

A.5.2.5.2.3 7.68 Mcps TDD option

A.5.2.6 E-UTRAN TDD - GSM Handover

A.5.2.6.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN to GSM cell handover delay specified in section 5.3.3.

The test parameters are given in Table A.5.2.6.1-1, A.5.2.6.1-2 and A.5.2.6.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 shall be used. The test consists of three successive time periods, with time duration 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 period T2, after the UE has reported Event B1. The start of T3 is defined as the end of 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 should be sent for the parameters specified in Table A.5.2.6.1-1.

Table A.5.2.6.1-1: General test parameters for E-UTRAN TDD toGSM neighbours handover test case in AWGN propagation condition

Pai	rameter	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
Gap Pattern Id			1	As specified in TS 36.133 section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Uplink-downlink o	configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe	Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell	CP length of cell 1		Normal	
Inter-RAT measu	rement quantity		GSM Carrier RSSI	
E-UTRA RF Char	nnel Number		1	E-UTRA RF Channel Number
E-UTRA Channel (BW _{channel})	Bandwidth	MHz	10	E-UTRA Channel Bandwidth (BW _{channel})
Threshold other s	Threshold other system		-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		S	20	
T2		S	7	
T3		S	1	

Table A.5.2.6.1-2: Cell Specific Parameters for Handover E- UTRAN TDD to GSM handover test case

Parameter	Unit Cell 1		II 1	
	1	T1, T2	Т3	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	1	0	
OCNG Patterns defined in				
A.3.2.2.1 (OP.1 TDD) and in		OP.1 TDD	OP.2 TDD	
A.3.2.2.2 (OP.2 TDD)				
PBCH_RA	dB			
PBCH_ RB	dB			
PSS_ RA	dB			
SSS_RA	dB			
PCFICH_ RB	dB			
PHICH_ RA	dB	7		
PHICH_ RB	dB	()	
PDCCH_ RA	dB			
PDCCH_ RB	dB	7		
PDSCH_ RA	dB			
PDSCH_ RB	dB			
OCNG_ RA Note1	dB			
OCNG_ RB Note1	dB			
\hat{E}_s/N_{oc}	dB	4		
$N_{\ oc}$ Note 2	dBm/15 kHz	-98 (AWGN)		
\hat{E}_s/I_{ot}	dB	4		
RSRP Note 3	dBm/15kHz	-g	4	
Propagation Condition		AW	GN	
NOTE 1: OCNG shall be used s	such that cell 1 is f	ully allocated and a constant tot	al transmitted nower spectral	

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

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

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

Table A A.5.2.6.1-3: Cell Specific Parameters for Handover E-UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)			
Parameter	Onit	T1	T2, T3		
Absolute RF Channel Number		ARFCN 1			
RXLEV	dBm	-85	-75		

A.5.2.6.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 100 ms from the beginning of time period T3.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay} = 90 \text{ ms} (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}$

T_{offset}: Equal to 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} : Equal to 4.65 ms, the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 99.3 ms, allow 100 ms in the test case.

A.5.2.7 E-UTRAN FDD – UTRAN FDD Handover; Unknown Target Cell

A.5.2.7.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to UTRAN FDD handover requirements for the case when the target cell is unknown as specified in section 5.3.1.

The test parameters are given in Tables A.5.2.7.1-1, A.5.2.7.1-2 and A.5.2.7.1-3. The test consists of two successive time periods, with time durations of T1, T2. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

Table A.5.2.7.1-1: General test parameters for E-UTRAN FDD to UTRAN FDD handover test case

Par	ameter	Unit	Value	Comment
PDSCH paramete	rs		DL Reference Measurement	As specified in section A.3.1.1.1
·			Channel R.0 FDD	
PCFICH/PDCCH/I	PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	E-UTRAN cell
	Neighbouring cell		Cell 2	UTRAN cell
Final condition	Active cell		Cell 2	UTRAN cell
Channel Bandwidt	h (BW _{channel})	MHz	10	
E-UTRAN FDD m	easurement quantity		RSRP	
Inter-RAT (UTRAN	N FDD) measurement		CPICH Ec/N0	
DRX			OFF	Non-DRX test
Access Barring Inf	ormation	-	Not sent	No additional delays in random
				access procedure
E-UTRA RF Chan	nel Number		1	One E-UTRA FDD carrier
				frequency is used.
E-UTRA Channel	Bandwidth	MHz	10	
(BWchannel)				
UTRA RF Channe	l Number		1	One UTRA FDD carrier frequency is used.
Monitored UTRA F	DD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification p	eriod		False	
T1		S	≤5	
T2		S	1	

Table A.5.2.7.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

Parameter	Unit	Cell 1 (E-UTRA)		
		T1	T2		
E-UTRA RF Channel			1		
number					
BW _{channel}	MHz		10		
OCNG Patterns defined in		OP.1 FDD	OP.2 FDD		
A.3.2.1.1 (OP.1 FDD) and in					
A.3.2.1.2 (OP.2 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{E}_{\scriptscriptstyle s}/I_{\scriptscriptstyle ot}$	dB	0	0		
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-	98		
\hat{E}_s/N_{oc}	dB	0	0		
RSRP Note 3	dBm/15 KHz	-98	-98		
Propagation Condition					
Note 1: OCNG shall be use a constant total train		•			
for all OFDM symbol		pooliai delisit	, is define ved		

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 $^{N_{oc}}$

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

Table A.5.2.7.1-3: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 2)

Parameter	Unit	Cell 2	(UTRA)	
		T1	T2	
CPICH_Ec/lor	dB	-	10	
PCCPCH_Ec/lor	dB	-	12	
SCH_Ec/lor	dB	-	12	
PICH_Ec/lor	dB	-	15	
DCH_Ec/lor	dB	Note 1		
OCNS_Ec/lor	dB	Note 2		
\hat{I}_{or}/I_{oc}	dB	-infinity	-1.8	
I_{oc}	dBm/3,84 MHz	-70	-70	
CPICH_Ec/lo	dB	-infinity	-14	
Propagation Condition	AWGN			
Note 1: The DPCH level is controlled by the power control loop Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I _{or} .				

A.5.2.7.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 290 ms from the beginning of time period T2.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + $T_{interrunt}$, where:

RRC procedure delay is 50ms. See section 5.3.1.1.1.

 $T_{interrupt}$ is 240ms. See section 5.3.1.1.2.

This gives a total of 290ms in the test case.

A.5.2.8 E-UTRAN FDD - GSM Handover; Unknown Target Cell

A.5.2.8.1 Test Purpose and Environment

This test is to verify the E-UTRAN FDD to GSM handover requirements for the case when the target GSM cell is unknown as specified in section 5.3.3.

The test parameters are given in Table A.5.2.8.1-1, A.5.2.8.1-2 and A.5.2.8.1-3 below. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

Table A.5.2.8.1-1: General test parameters for E-UTRAN FDD to GSM handover test case; unknown target cell

Para	meter	Unit	Value	Comment
PDSCH paramete	ers		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/ parameters	PHICH		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
T1		S	7	
T2		S	1	

Table A.5.2.8.1 - 2: Cell specific parameters for cell # 1 in E-UTRAN FDD to GSM handover test case; unknown target cell

Parameter	Unit	Cell 1			
		T1	T2		
BW _{channel}	MHz		10		
OCNG Patterns					
defined in A.3.2.1.1					
(OP.1 FDD) and in		OP.1 FDD OP.2 FDD			
A.3.2.1.2 (OP.2					
FDD)					
PBCH_RA	dB				
PBCH_ RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_ RB	dB				
PHICH_ RA	dB				
PHICH_ RB	dB	0			
PDCCH_ RA	dB				
PDCCH_ RB	dB				
PDSCH_ RA	dB				
PDSCH_RB	dB				
OCNG_RA Note1	dB				
OCNG_ RB Note1	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB		4		
Note 2	dBm/15 kHz		-98		
\hat{E}_s/N_{oc}	dB		4		
RSRP Note 3	dBm/15 kHz		-94		
Propagation		AWGN			
Condition			_		
		hat cell 1 is fully allocate			
transmitted power spectral density is achieved for all OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the test is					
	assumed to be constant over subcarriers and time and shall be modelled as				
AWGN of appropriate power for $^{N_{oc}}$ to be fulfilled.					
Note 3: RSRP levels have been derived from other parameters for information					
purposes. They are not settable parameters themselves.					

Table A.5.2.8.1-3: Cell specific parameters for cell # 2 in E-UTRAN FDD to GSM handover test case; unknown target cell

Parameter	Unit	Cell	(GSM)	
Farameter	Onit	T1	T2	
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-Infinity	-75	

A.5.2.8.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 200 ms from the beginning of time period T2.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay}$ = 190 ms (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}

 T_{offset} : Equal to 4.65 ms is the GSM timing uncertainty from the time when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

T_{UL}: Equal to 4.65 ms is the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame.

This gives a total of 199.3 ms, allow 200 ms in the test case.

A.5.2.9 E-UTRAN TDD - GSM Handover; Unknown Target Cell

A.5.2.9.1 Test Purpose and Environment

This test is to verify the E-UTRAN TDD to GSM handover requirements for the case when the target GSM cell is unknown as specified in section 5.3.3.

The test parameters are given in Table A.5.2.9.1 -1, A.5.2.9.1 -2 and A.5.2.9.1 -3 below. The test consists of two successive time periods, with time duration of T1, T2 respectively. At the start of time duration T1, the UE will not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE receives a RRC handover command from the network. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. No Gap pattern configuration shall be used.

Table A.5.2.9.1-1: General test parameters for E-UTRAN TDD to GSM handover test case; unknown target cell

Para	meter	Unit	Value	Comment
PDSCH paramete	ers		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.2.2.1
PCFICH/PDCCH/ parameters	/PHICH		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.2.2.2
Gap Pattern Id			None	No measurement gaps shall be provided.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
DRX			OFF	No DRX configured
Special subframe	configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink configuration			1	As specified in table 4.2-2 in 3GPP TS 36.211
T1		S	7	
T2		s	1	

Table A.5.2.9.1 - 2: Cell specific parameters for cell # 1 in E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter	Unit	Cell 1			
		T1	T2		
BW _{channel}	MHz		10		
OCNG Patterns					
defined in A.3.2.2.1					
(OP.1 TDD) and in		OP.1 TDD OP.2 TDD			
A.3.2.2.2 (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		
PDCCH_ RA	dB				
PDCCH_ RB	dB				
PDSCH_ RA	dB				
PDSCH_ RB	dB				
OCNG_ RA Note1	dB				
OCNG_ RB Note1	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4			
N_{oc} Note 2	dBm/15 kHz		-98		
\hat{E}_s/N_{oc}	dB	4			
RSRP Note 3	dBm/15 kHz	-94			
Propagation		AWGN			
Condition			_		
		hat cell 1 is fully allocate			
transmitted power spectral density is achieved for all OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the test is					
assumed to be constant over subcarriers and time and shall be modelled as					
AWGN of appropriate power for N_{oc} to be fulfilled.					
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

Table A.5.2.9.1 - 3: Cell specific parameters for cell # 2 in E-UTRAN TDD to GSM handover test case; unknown target cell

Parameter	Unit	Cell 2	2 (GSM)	
Farameter	Ollit	T1 T2		
Absolute RF Channel Number		ARFCN 1		
RXLEV	dBm	-Infinity	-75	

A.5.2.9.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 200 ms from the beginning of time period T2.

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

NOTE: The test requirement in this test case is expressed as:

 $T_{Handover delay}$ = 190 ms (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}

 T_{offset} : Equal to 4.65 ms is the GSM timing uncertainty from the time when the UE is ready to transmit until the start of the next timeslot in GSM 26 multiframe structure

 T_{UL} : Equal to 4.65 ms is the time the UE has to wait in case the next timeslot is an idle frame or a SACCH frame. This gives a total of 199.3 ms, allow 200 ms in the test case.

A.5.2.10 E-UTRAN TDD to UTRAN TDD handover: unknown target cell

A.5.2.10.1 Test Purpose and Environment

This test is to verify the requirement for E-UTRAN TDD to UTRAN TDD handover requirements specified in section 5.3.2 when the target UTRAN TDD cell is unknown.

The test scenario comprises of 1 E-UTRAN TDD cell and 1 UTRAN TDD cell as given in tables A.5.2.10.1-1, A.5.2.10.1-2, and A.5.2.10.1-3. No gap pattern is configured in the test case.

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, a RRC message implying handover to UTRA 1.28Mcps TDD cell shall be sent to the UE. The end of the last TTI containing handover message is the beginning of T2 duration.

Table A.5.2.10.1-1: General test parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case

Para	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDC parameters	PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial	Active cell		Cell 1	E-UTRAN TDD cell
conditions	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD cell
Final conditions	Active cell		Cell 2	UTRA 1.28Mcps TDD cell
CP length of	cell 1		Normal	
Uplink-downli of cell 1	nk configuration		1	As specified in table 4.2.2 in TS 36.211
Special subfraconfiguration			6	As specified in table 4.2.1 in TS 36.211
Time offset be	etween cells		3 ms	Asynchronous cells
Access Barrir	cess Barring Information		Not Sent	No additional delays in random access procedure.
TimeToTrigge	er	S	0	
Filter coefficie	ent		0	L3 filtering is not used
DRX			OFF	
T1		S	5	During T1, cell 2 shall be powered off, and during the off time the physical layer cell identity shall be changed.
T2	·	S	1	

Table A.5.2.10.1-2: Cell specific test parameters for E-UTRAN TDD to unknown UTRAN TDD cell handover test case (cell 1)

Parameter	Unit	Ce	II 1		
		T1	T2		
E-UTRA RF Channel		1			
Number					
BWchannel	MHz	1	0		
OCNG Patterns defined in		OP.1 TDD	OP.2 TDD		
TS36.133 A.3.2.2.1 (OP.1					
TDD) and in A.3.2.2.2					
(OP.2 TDD)					
PBCH_RA	dB	-			
PBCH_RB	dB	-			
PSS_RB	dB				
SSS_RB	dB				
PCFICH_PA	dB				
PHICH_PA	dB				
PHICH_PB	dB	0	0		
PDCCH_PA	dB				
PDCCH_PB	dB				
PDSCH_PA	dB				
PDSCH_PB	dB				
OCNG_RANote 1	dB				
OCNG_RBNote 1	dB				
\hat{E}_s/I_{ot}	dB	3	3		
\hat{E}_s/N_{oc}	dB	3	3		
N_{oc}	dBm/15kHz	-(98		
RSRP	dBm/15kHz	-95	-95		
SCH_RP	dBm/15 kHz	-95	-95		
Propagation Condition		AW	/GN		
Note 1: OCNG shall be used such that cell is fully allocated and a					

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

Note 2: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable

parameters themselves.

Table A.5.2.10.1-3: Cell specific test parameters for E-UTRAN TDD to unknown UTRAN TDD cell test case (cell 2)

Unit	Cell 2 (UTRA)			
	0 DwP		PTS	
	T1	T2	T1	T2
	Channel 2			
dB	Ÿ	3		
dB			0	
dB		3		
dB	-infinity 13		-infinity	13
dBm/1.28 MHz	-80			
dBm	-infinity -70 n.a.		a.	
	AWGN			
	dB dB dB dB dB dBm/1.28 MHz dBm	dB -: dB -: dB -: dB -: dB -: finfinity dBm/1.28 MHz dBminfinity	Image: color of the	0 DWF T1 T2 T1

Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the

primary frequency's channel number.

Note2: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.5.2.10.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than [280] ms from the beginning of time period T2.

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

A.5.3 E-UTRAN Handover to Non-3GPP RATs

A.5.3.1 E-UTRAN FDD – HRPD Handover

A.5.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to HRPD handover requirements specified in section 5.4.1.

The test parameters are given in Tables A.5.3.1.1-1, A.5.3.1.1-2 and A.5.3.1.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.1.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case

Para	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
nitial conditions Active cell			Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth	(BW _{channel})	MHz	10	
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD me	asurement quantity		RSRP	
Inter-RAT (HRPD) quantity			CDMA2000 HRPD Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDI	MA2000	dB	-7	Absolute 'CDMA2000 HRPD Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Info	ormation	-	Not sent	No additional delays in random access procedure
E-UTRA RF Chann	el Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel E (BWchannel)	Bandwidth	MHz	10	
HRPD RF Channel	Number		1	One HRPD carrier frequency is used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-Search\	VindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		s	5	
T2		s	≤10	
T3		s	1	

Table A.5.3.1.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to HRPD cell # 2

Parameter	Unit	Cell 1 (E-UTRA)			
		T1 T2 T3			
E-UTRA RF Channel		1			
number					
BW _{channel}	MHz		10		
OCNG Patterns defined in		OP.1	FDD	OP.2	
A.3.2.1.1 (OP.1 FDD) and				FDD	
in A.3.2.1.2 (OP.2 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	0			
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				
$N_{oc}^{ m Note~2}$	dBm/15		-98		
	kHz				
RSRP Note 3	dBm/15	-98	-98	-98	
	KHz				
\hat{E}_s/N_{oc}	dB	0 0		0	
\hat{E}_s/I_{ot}	dB	0 0 0			
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 $N_{\it oc}$ to be fulfilled.

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

Table A.5.3.1.1-3: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (HRPD)			
		T1	T2	Т3	
$\frac{\text{Control} \text{E}_{\text{b}}}{\text{N}_{\text{t}}} \text{(38.4 kbps)}$	dB	21			
$\frac{\text{Control} \text{E}_{\text{b}}}{\text{N}_{\text{t}}} $ (76.8 kbps)	dB	18			
\hat{I}_{or}/I_{oc}	dB	-infinity	0	0	
I_{oc}	dBm/1.2288 MHz	-55			
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3	
Propagation Condition		AWGN			

A.5.3.1.2 Test Requirements

The UE shall start transmission of the reverse control channel in HRPD to Cell 2 less than 127 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 50 ms, which is specified in section 5.4.1.1.1.

 $T_{interrupt} = 76.66$ ms in the test; $T_{interrupt}$ is defined in section 5.4.1.1.2.

This gives a total of 126.66 ms, allow 127 ms in the test.

A.5.3.2 E-UTRAN FDD – cdma2000 1X Handover

A.5.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to cdma2000 1X handover requirements specified in section 5.4.2.

The test parameters are given in Tables A.5.3.2.1-1, A.5.3.2.1-2 and A.5.3.2.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.2.1-1: General test parameters for E-UTRAN FDD to cdma2000 1X handover test case

Para	meter	Unit	Value	Comment
PDSCH parameters	PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidth	(BW _{channel})	MHz	10	
Gap Pattern Id			0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD mea	asurement quantity		RSRP	
	00 1X) measurement		CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDN	/A2000	dB	-14	Absolute 'CDMA2000 1xRTT Pilot Strength' threshold for event B2
Hysteresis		dB	0	
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	Non-DRX test
Access Barring Info	rmation	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channo	el Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel B (BWchannel)	andwidth	MHz	10	
cdma2000 1X RF C	hannel Number		1	One HRPD carrier frequency is used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000 1X RF channel 1 provided in the cell list before T2.
cdma2000-SearchV	VindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		S	5	
T2		s	≤10	
T3		s	1	

Table A.5.3.2.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to cdma2000 1X cell #2

Parameter	Unit	Cell 1 (E-UTRA)			
		T1	T2	T3	
E-UTRA RF Channel			1		
number					
BW _{channel}	MHz		10		
OCNG Patterns defined in		OP.1	FDD	OP.2	
A.3.2.1.1 (OP.1 FDD) and				FDD	
in A.3.2.1.2 (OP.2 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$N_{oc}^{ m Note 2}$	dBm/15		-98		
	kHz	20			
RSRP Note 3	dBm/15	-98	-98	-98	
	KHz			•	
\hat{E}_s/N_{oc}	dB	0	0	0	
\hat{E}_s/I_{ot}	dB	0 0 0			
Propagation Condition		AWGN			
	NG shall be used such that both cells are fully allocated and a stant total transmitted power spectral density is achieved for all DM symbols.				
Note 2: Interference from	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall				
test is assumed to	test is assumed to be constant over subcamers and time and shall				

be modelled as AWGN of appropriate power for N_{oc} to be fulfilled. RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 3:

Table A.5.3.2.1-3: Cell specific test parameters for cdma2000 1X (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (cdma2000 1X)			
		T1	T2	Т3	
Pilot E _c	dB	-7			
Sync E _c I _{or}	dB	-16			
$\frac{\text{Paging } E_{\text{c}}}{I_{\text{or}}} \text{ (4.8 kbps)}$	dB	-12			
\hat{I}_{or}/I_{oc}	dB	-infinity 0 C		0	
I_{oc}	dBm/1.2288 MHz		-55		
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10	-10	
Propagation Condition		AWGN			

A.5.3.2.2 Test Requirements

The UE shall start transmission of the reverse control channel in cdma2000 1X to Cell 2 less than 200 ms from the beginning of time period T3.

NOTE: The handover delay can be expressed as: RRC procedure delay + T_{interrupt}, where:

RRC procedure delay = 130 ms, which is specified in section 5.4.2.1.1.

 $T_{interrupt} = 70$ ms in the test; $T_{interrupt}$ is defined in section 5.4.2.1.2.

This gives a total of 200 ms.

A.5.3.3 E-UTRAN FDD – HRPD Handover; Unknown Target Cell

A.5.3.3.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to HRPD handover requirements for the case when the target HRPD cell is unknown as specified in section 5.4.1.

The test parameters are given in Tables A.5.3.3.1-1, A.5.3.3.1-2 and A.5.3.3.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. During time period T1, message containing Information Element *systemTimeInfo* as defined in section 6.3.1 of TS 36.331 [2] shall be sent by the System Simulator (SS). No gap patterns are configured in the test case. No HRPD neighbour cell list shall be provided to the UE.

A RRC message implying handover to the unknown HRPD cell shall be sent to the UE towards the end of the time period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.3.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case; unknown target HRPD cell

Para	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidtl	h (BW _{channel})	MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Chann	E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel (BWchannel)	Bandwidth	MHz	10	
HRPD RF Channe	l Number		1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1	·	S	≤5	
T2		S	1	

Table A.5.3.3.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to unknown HRPD cell # 2

Parameter	Unit	Cell 1 (E-U	TRAN FDD)		
		T1	T2		
E-UTRA RF Channel			1		
number					
BW _{channel}	MHz	1	0		
OCNG Patterns defined in		OP.1	FDD		
A.3.2.1.1 (OP.1 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$N_{oc}^{ m Note2}$	dBm/15 kHz	-6	98		
RSRP Note 3	dBm/15 kHz	-98	-98		
\hat{E}_s/N_{oc}	dB	0	0		
\hat{E}_s/I_{ot}	dB	0	0		
Propagation Condition		AWGN			

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

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

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

Table A.5.3.3.1-3: Cell specific test parameters for unknown HRPD (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (HRPD)			
		T1	T2		
Control E_b (38.4		2	1		
N _t	dB				
kbps)					
Control E_b (76.8		18			
N_{t}	dB				
kbps)					
\hat{I}_{or}/I_{oc}	dB	-infinity	0		
I_{oc}	dBm/1.22 88 MHz	-55			
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3		
Propagation Condition		AWGN			

A.5.3.3.2 Test Requirements

The UE shall start transmission of the reverse control channel in HRPD to Cell 2 less than 127 ms from the beginning of time period T2.

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

NOTE: The handover delay is expressed as: RRC procedure delay + $T_{interrupt}$, where:

T_{interrupt} also includes time to detect HRPD cell; see section 5.4.1.1.2

This gives a total of 126.66 ms, allow 127 ms in the test case.

A.5.3.4 E-UTRAN FDD – cdma2000 1X Handover; Unknown Target cell

A.5.3.4.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to cdma2000 1X handover requirements for the case when the target cdma2000 1X cell is unknown as specified in section 5.4.2.

The test parameters are given in Tables A.5.3.4.1-1, A.5.3.4.1-2 and A.5.3.4.1-3. The test consists of two successive time periods, with time durations of T1 and T2 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. During time period T1, message containing Information Element *systemTimeInfo* as defined in section 6.3.1 of TS 36.331 [2] shall be sent by the System Simulator (SS). No gap patterns are configured in the test case. No cdma2000 1X neighbour cell list shall be provided to the UE.

A RRC message implying handover to the unknown cdma2000 1X cell shall be sent to the UE towards the end of the time period T1. The start of T2 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Table A.5.3.2.1-1: General test parameters for E-UTRAN FDD to cdma2000 1X handover test case; unknown target cdma2000 1X cell

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidtl	h (BW _{channel})	MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
cdma2000 1X RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		S	≤5	
T2		s	1	

Table A.5.3.2.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to unknown cdma2000 1X cell # 2

Parameter	Unit	Cell 1 (E-UTRAN FDD)			
		T1	T2		
E-UTRA RF Channel number			1		
BW _{channel}	MHz	1	0		
OCNG Patterns defined in		OP.1	FDD		
A.3.2.1.1 (OP.1 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB		0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB	7			
OCNG_RB Note 1	dB				
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-9	98		
RSRP Note 3	dBm/15 kHz	-98	-98		
\hat{E}_s/N_{oc}	dB	0	0		
\hat{E}_s/I_{ot}	dB	0	0		
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

 $N_{\it oc}$ to be fulfilled.

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

Table A.5.3.2.1-3: Cell specific test parameters for unknown cdma2000 1X (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

Parameter	Unit	Cell 2 (cdma2000 1X)				
		T1	Т2			
Pilot E _c	dB	-7				
Sync E _c	dB	-16				
$\frac{\text{Paging} \text{E}_{\text{c}}}{\text{I}_{\text{or}}} \text{(4.8 kbps)}$	dB	-12				
\hat{I}_{or}/I_{oc}	dB	-infinity 0				
I_{oc}	dBm/1.22 88 MHz	-55				
CDMA2000 1xRTT Pilot Strength	dB	-infinity -10				
Propagation Condition		AWGN				

A.5.3.4.2 Test Requirements

The UE shall start transmission of the reverse control channel in cdma2000 1X to Cell 2 less than 200 ms from the beginning of time period T2.

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

NOTE: The handover delay is expressed as: RRC procedure delay + $T_{interrupt}$, where:

T_{interrupt} also includes time to detect cdma2000 1X cell; see section 5.4.2.1.2

This gives a total of 200 ms.

A.6 RRC Connection Control

A.6.1 RRC Re-establishment

A.6.1.1 E-UTRAN FDD Intra-frequency RRC Re-establishment

A.6.1.1.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

The test parameters are given in table A.6.1.1.1-1 and table A.6.1.1.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.1.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

Parameter		Unit	Value	Comment		
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1		
PCFICH/PDCCH/	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1		
Initial conditions	Active cell		Cell 1			
	Neighbouring cell		Cell 2			
Final condition	Active cell		Cell 2			
E-UTRA RF Chan	E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.		
Channel Bandwid	th (BW _{channel})	MHz	10			
N310		-	1	Maximum consecutive out-of-sync indications from lower layers		
N311		-	1	Minimum consecutive in-sync indications from lower layers		
T310		ms	0	Radio link failure timer; T310 is disabled		
T311		ms	3000	RRC re-establishment timer		
DRX			OFF			
CP length			Normal			
Access Barring Information		-	Not Sent	No additional delays in random access procedure.		
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211		
Time offset between cells		ms	3	Asynchronous cells		
T1		s	5			
T2		ms	200			
T3		s	3			

Table A.6.1.1.1-2: Cell specific test parameters for E-UTRAN FDD intra-frequency RRC Reestablishment test case

Parameter	Unit	Cell 1			Cell 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel		1			1			
Number								
BW _{channel}	MHz		10		10			
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD	
defined in A.3.2.1.1		FDD	FDD	FDD				
(OP.1 FDD) and in								
A.3.2.1.2 (OP.2 FDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB					•		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							

$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
$N_{oc}^{\text{Note 2}}$	dBm/15 KHz				-98		•
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94
Propagation Condition		AWGN					

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

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

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

A.6.1.1.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the RRCConnectionReestablishmentRequest message to cell 2.

The RRC re-establishment delay to a known E-UTRA FDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-establish delay}} = T_{UL \text{ grant}} + T_{UE \text{ re-establish delay}}$$

Where:

 T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \ ms + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

 $N_{\text{freq}} = 1$

 $T_{\text{search}} = 100 \text{ ms}$

 T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in 3GPP TS 36.331 for the target E-UTRAN FDD cell.

 $T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.1.2 E-UTRAN FDD Inter-frequency RRC Re-establishment

A.6.1.2.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA FDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

The test parameters are given in table A.6.1.1.2-1 and table A.6.1.1.2-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of radio link failure. At the start of time period T3, cell 2, which is the neighbour cell, is activated.

Table A.6.1.2.1-1: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

Para	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/P	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	nel Number (cell 1)		1	
E-UTRA RF Chann			2	
E-UTRA FDD inter	-frequency carrier list		1	2 E-UTRA FDD carrier
size				frequencies in total: 1 intra-
				frequency and 1 inter-frequency
Channel Bandwidth	า (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
PRACH configurati	on index		4	As specified in table 5.7.1-2 in TS 36.211
Time offset between	n cells	ms	3	Asynchronous cells
T1		S	5	
T2		ms	200	
T3		S	5	

Table A.6.1.2.1-2: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 FDD	OP.2 FDD	OP.1 FDD
defined in A.3.2.1.1		FDD	FDD	FDD			
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB					•	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
$N_{oc}^{ m Note~2}$	dBm/15 KHz				-98		
\hat{E}_s/N_{oc}	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition			•		AWGN	•	•

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

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

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

A.6.1.2.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA FDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{\text{re-establish_delay}} = T_{UL_grant} + T_{UE_re\text{-establish_delay}}.$$

Where:

 T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

 $N_{\text{freq}} = 2$

 $T_{search} = 800 \text{ ms}$

 T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in 3GPP TS 36.331 for the target E-UTRAN FDD cell.

 $T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, allow 3 s in the test case.

A.6.1.3 E-UTRAN TDD Intra-frequency RRC Re-establishment

A.6.1.3.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA TDD intra-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

The test parameters are given in table A.6.1.3.1-1 and table A.6.1.3.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of the radio link failure.

Table A.6.1.3.1-1: General test parameters for E-UTRAN TDD intra-frequency RRC Re-establishment test case

Para	ameter	Unit	Value	Comment
PDSCH parameters	S		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/P	•		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth	n (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	3000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Info	ormation	-	Not Sent	No additional delays in random access procedure.
Special subframe of	onfiguration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink co	nfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configurati	on index		53	As specified in table 5.7.1-3 in TS 36.211
Time offset betwee	n cells	μs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		S	3	

Table A.6.1.3.1-2: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1			Cell 2		
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD	
defined in A.3.2.2.1		TDD	TDD	TDD				
(OP.1 TDD) and in								
A.3.2.2.2 (OP.2 TDD)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PCFICH_RB	dB							
PHICH_RA	dB							
PHICH_RB	dB		•			•		
PDCCH_RA	dB		0			0		
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note 1}	dB							
\hat{E}_{s}/I_{ot}	dB	1.54	-Infinity	-Infinity	-3.79	4	4	
Noc Note 2	dBm/15 KHz				-98	·		
\hat{E}_s/N_{oc}	dB	7	-Infinity	-Infinity	4	4	4	
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94	
Propagation Condition					AWGN			

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

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

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

A.6.1.3.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to a known E-UTRA TDD intra frequency cell shall be less than 1.5 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-establish_delay}} = T_{UL_grant} + T_{UE_re\text{-establish_delay}}.$$

Where:

 T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

 $N_{freq} = 1$

 $T_{\text{search}} = 100 \text{ ms}$

 T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in 3GPP TS 36.331 for the target E-UTRAN TDD cell.

 $T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 1445 ms, allow 1.5 s in the test case.

A.6.1.4 E-UTRAN TDD Inter-frequency RRC Re-establishment

A.6.1.4.1 Test Purpose and Environment

The purpose is to verify that the E-UTRA TDD inter-frequency RRC re-establishment delay is within the specified limits. These tests will verify the requirements in section 6.1.2.

The test parameters are given in table A.6.1.4.1-1 and table A.6.1.4.1-2 below. The test consists of 3 successive time periods, with time duration of T1, T2 and T3 respectively. At the start of time period T2, cell 1, which is the active cell, is deactivated. The time period T3 starts after the occurrence of radio link failure. At the start of time period T3, cell 2, which is the neighbour cell, is activated.

Table A.6.1.4.1-1: General test parameters for E-UTRAN TDD inter-frequency RRC Re-establishment test case

Par	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	nel Number (cell 1)		1	
E-UTRA RF Chann	nel Number (cell 2)		2	
E-UTRA TDD inter size	-frequency carrier list		1	2 E-UTRA TDD carrier frequencies in total: 1 intra- frequency and 1 inter-frequency
Channel Bandwidt	h (BW _{channel})	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Info	ormation	-	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 co	nfiguration		1	As specified in table 4.2-2 in TS 36.211
PRACH configurat	ion index		53	As specified in table 5.7.1-3 in TS 36.211
Time offset between	en cells	μs	3	Synchronous cells
T1		s	5	
T2		ms	200	
T3		s	5	

Table A.6.1.4.1-2: Cell specific test parameters for E-UTRAN TDD inter-frequency RRC Reestablishment test case

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns		OP.1	OP.1	OP.2	OP.2 TDD	OP.2 TDD	OP.1 TDD
defined in A.3.2.2.1		TDD	TDD	TDD			
(OP.1 TDD) and in							
A.3.2.2.2 (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			•	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
$N_{oc}^{ m Note~2}$	dBm/15 KHz				-98	·	·
\hat{E}_s/N_{oc}	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91
Propagation Condition			AWGN				

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

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

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

A.6.1.4.2 Test Requirements

The RRC re-establishment delay is defined as the time from the start of time period T3, to the moment when the UE starts to send PRACH preambles to cell 2 for sending the *RRCConnectionReestablishmentRequest* message to cell 2.

The RRC re-establishment delay to an unknown E-UTRA TDD inter frequency cell shall be less than 3 s.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The RRC re-establishment delay in the test is derived from the following expression:

$$T_{re\text{-establish_delay}} = T_{UL_grant} + T_{UE_re\text{-establish_delay}}.$$

Where:

 T_{UL_grant} = It is the time required to acquire and process uplink grant from the target cell. The PRACH reception at the system simulator is used as a trigger for the completion of the test; hence T_{UL_grant} is not used.

$$T_{UE_re\text{-establish_delay}} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$$

 $N_{\text{freq}} = 2$

 $T_{search} = 800 \text{ ms}$

 T_{SI} = 1280 ms; it is the time required for receiving all the relevant system information as defined in 3GPP TS 36.331 for the target E-UTRAN TDD cell.

 $T_{PRACH} = 15$ ms; it is the additional delay caused by the random access procedure.

This gives a total of 2945 ms, allow 3 s in the test case.

A.6.2 Random Access

A.6.2.1 E-UTRAN FDD – Contention Based Random Access Test

A.6.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Section 6.2.2 and Section 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.1.1-1 and A.6.2.1.1-2.

Table A.6.2.1.1-1: General test parameters for FDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10	
OCNG Pattern		OP.1 FDD	As defined in A.3.2.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As defined in A.3.1.1.1.
PCFICH/PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.
parameters		Channel R.6 FDD	
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG RA Note 1	dB		
OCNG_RB Note 1	dB		
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}^{-}$	dB	3	
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
	dBm/15 KHz	-5	As defined in clause 6.3.2
referenceSignalPower			in 3GPP TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in 3GPP TS 36.101.
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321.
Propagation Condition	.	AWGN	

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table A.6.2.1.1-2: RACH-Configuration parameters for FDD contention based random access test

Field	Value	Comment		
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax	n6			
ra-ResponseWindowSize	sf10	10 sub-frames		
mac-ContentionResolutionTimer	sf48	48 sub-frames		
maxHARQ-Msg3Tx	4			
Note: For further information see Section 6.3.2 in 3GPP TS 36.331.				

A.6.2.1.2 Test Requirements

Contention based random access is triggered by *not* explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.1.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.1.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

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.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.1.2.2 No Random Access Response Reception

To test the UE behavior specified in subclause 6.2.2.1.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

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 RA Response window.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.1.2.3 Receiving a NACK on msg3

To test the UE behavior specified in subclause 6.2.2.1.3 the System Simulator shall NACK *all* UE msg3 following a successful Random Access Response.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ re-transmissions is reached.

A.6.2.1.2.4 Reception of an Incorrect Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element *not* matching the CCCH SDU transmitted in msg3 uplink message.

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 transmitted in the uplink message.

A.6.2.1.2.5 Reception of a Correct Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

The UE shall send ACK if the Contention Resolution is successful.

A.6.2.1.2.6 Contention Resolution Timer expiry

To test the UE behavior specified in Subclause 6.2.2.1.6 the System Simulator shall *not* send a response to a msg3.

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.

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

A.6.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Section 6.2.2 and Section 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.2.1-1 and A.6.2.2.1-2.

Table A.6.2.2.1-1: General test parameters for FDD non-contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
BW _{channel}	MHz	10	A 1 (" 1: A 0 0 4 4
OCNG Pattern		OP.1 FDD	As defined in A.3.2.1.1.
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As defined in A.3.1.1.1.
PCFICH/PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.
parameters		Channel R.6 FDD	
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	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	3	
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
	dBm/15 KHz	-5	As defined in clause 6.3.2
referenceSignalPower			in 3GPP TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in 3GPP TS 36.101.
PRACH Configuration Index	-	4	As defined in table 5.7.1-2 in 3GPP TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321.
Propagation Condition	-	AWGN	55.1 10 00.0211

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table A.6.2.2.1-2: RACH-Configuration parameters for FDD non-contention based random access test

Field	Value	Comment		
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax	n6			
ra-ResponseWindowSize	sf10	10 sub-frames		
Note: For further information see Section 6.3.2 in 3GPP TS 36.331.				

A.6.2.2.2 Test Requirements

Non-Contention based random access is triggered by explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.2.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

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.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.2.2.2 No Random Access Response Reception

To test the UE behavior specified in subclause 6.2.2.2.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.3 E-UTRAN TDD – Contention Based Random Access Test

A.6.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Section 6.2.2 and Section 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.3.1-1 and A.6.2.3.1-2.

Table A.6.2.3.1-1: General test parameters for TDD contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number BW _{channel}	- MHz	1 10	
OCNG Pattern	-	OP.1 TDD	As defined in A.3.2.2.1.
PDSCH parameters	-	DL Reference Measurement Channel R.0 TDD	As defined in A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters	-	DL Reference Measurement Channel R.6 TDD	As defined in A.3.1.2.2.
Special subframe	-	6	As specified in table 4.2-1
configuration			in 3GPP TS 36.211.
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA SSS_RA	dB dB		
PCFICH RB	dВ		
PHICH RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB OCNG_RA Note 1	dB dB		
OCNG_RB Note 1	dB		
\hat{E}_{s}/I_{ot}	dB	3	
$\mathbf{E}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$			
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in 3GPP TS 36.101.
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1 in 3GPP TS 36.321.
Propagation Condition	-	AWGN	111 001 1 10 00.021.

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table A.6.2.3.1-2: RACH-Configuration parameters for TDD contention based random access test

Field	Value	Comment			
numberOfRA-Preambles	n52				
sizeOfRA-PreamblesGroupA	n52	No group B.			
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
ra-ResponseWindowSize	sf10	10 sub-frames			
mac-ContentionResolutionTimer	sf48	48 sub-frames			
maxHARQ-Msg3Tx	4				
Note: For further information see Section 6.3	Note: For further information see Section 6.3.2 in 3GPP TS 36.331.				

A.6.2.3.2 Test Requirements

Contention based random access is triggered by *not* explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.3.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.1.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

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.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.3.2.2 No Random Access Response reception

To test the UE behavior specified in Subclause 6.2.2.1.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

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 RA Response window.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.3.2.3 Receiving a NACK on msg3

To test the UE behavior specified in Subclause 6.2.2.1.3 the System Simulator shall NACK *all* UE msg3 following a successful Random Access Response.

The UE shall re-transmit the msg3 upon the reception of a NACK on msg3 until the maximum number of HARQ re-transmissions is reached.

A.6.2.3.2.4 Reception of an Incorrect Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element *not* matching the CCCH SDU transmitted in msg3 uplink message.

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 transmitted in the uplink message.

A.6.2.3.2.5 Reception of a Correct Message over Temporary C-RNTI

To test the UE behavior specified in Subclause 6.2.2.1.5 the System Simulator shall send a message addressed to the temporary C-RNTI with a UE Contention Resolution Identity included in the MAC control element matching the CCCH SDU transmitted in the msg3 uplink message.

The UE shall send ACK if the Contention Resolution is successful.

A.6.2.3.2.6 Contention Resolution Timer expiry

To test the UE behavior specified in Subclause 6.2.2.1.6 the System Simulator shall *not* send a response to a msg3.

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.

A.6.2.4 E-UTRAN TDD – Non-Contention Based Random Access Test

A.6.2.4.1 Test Purpose and Environment

The purpose of this test is to verify that the behavior of the random access procedure is according to the requirements and that the PRACH power settings and timing are within specified limits. This test will verify the requirements in Section 6.2.2 and Section 7.1.2 in an AWGN model.

For this test a single cell is used. The test parameters are given in tables A.6.2.4.1-1 and A.6.2.4.1-2.

Table A.6.2.4.1-1: General test parameters for TDD non-contention based random access test

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number BW _{channel}	- MHz	1 10	
OCNG Pattern	-	OP.1 TDD	As defined in A.3.2.2.1.
PDSCH parameters	-	DL Reference Measurement	As defined in A.3.1.1.2.
PCFICH/PDCCH/PHICH	-	Channel R.0 TDD DL Reference Measurement	As defined in A.3.1.2.2.
parameters		Channel R.6 TDD	As an acidical in table 4.0.4
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.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA SSS_RA	dB dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA PDCCH_RB	dB dB		
PDSCH_RA	dB		
PDSCH RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB Note 1	dB dB	3	
$\mathbf{\hat{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	иь	3	
N_{oc}	dBm/15 KHz	-98	
\hat{E}_s/N_{oc}	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331.
Configured UE transmitted	dBm	23	As defined in clause 6.2.5
power ($P_{ m CMAX}$)			in 3GPP TS 36.101.
PRACH Configuration Index	-	53	As defined in table 5.7.1-3 in 3GPP TS 36.211.
Backoff Parameter Index	-	2	As defined in table 7.2-1
Propagation Condition	-	AWGN	in 3GPP TS 36.321.

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter

Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.

Table A.6.2.4.1-2: RACH-Configuration parameters for TDD non-contention based random access test

Field	Value	Comment			
powerRampingStep	dB2				
preambleInitialReceivedTargetPower	dBm-120				
preambleTransMax	n6				
ra-ResponseWindowSize	sf10	10 sub-frames			
Note: For further information see Section 6.3.2 in 3GPP TS 36.331.					

A.6.2.4.2 Test Requirements

Non-Contention based random access is triggered by explicitly assigning a random access preamble via dedicated signalling in the downlink.

A.6.2.4.2.1 Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.1 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. In response to the first 4 preambles, the System Simulator shall transmit a Random Access Response *not* corresponding to the transmitted Random Access Preamble.

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.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.6.2.4.2.2 No Random Access Response Reception

To test the UE behavior specified in Subclause 6.2.2.2.2 the System Simulator shall transmit a Random Access Response containing a Random Access Preamble identifier corresponding to the transmitted Random Access Preamble after 5 preambles have been received by the System Simulator. The System Simulator shall *not* respond to the first 4 preambles.

The UE shall re-transmit the preamble with the calculated PRACH transmission power.

In addition, the power applied to all preambles shall be in accordance with what is specified in Subclause 6.2.2. The power of the first preamble shall be -30 dBm with an accuracy specified in section 6.3.5.1.1 of 3GPP TS 36.101 [5]. The relative power applied to additional preambles shall have an accuracy specified in section 6.3.5.2.1 of 3GPP TS 36.101 [5].

The transmit timing of all PRACH transmissions shall be within the accuracy specified in Subclause 7.1.2.

A.7 Timing and Signalling Characteristics

A.7.1 UE Transmit Timing

A.7.1.1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests

A.7.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in section 7.1.2.

For this test a single cell is used. Table A.7.1.1.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting sounding reference symbols using the configuration defined in Table A.7.1.1.1-2.

Table A.7.1.1.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Parameter	Unit	Value		
Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth (BW _{channel})	MHz	10	10	1.4
DRX cycle	ms	OFF	80 ^{Note5}	OFF
PDCCH/PCFICH/PHICH				
Reference measurement channel Note:		R.6 FDD	R.6 FDD	R.8 FDD
OCNG Pattern ^{Note2}		OP.2 FDD	OP.2 FDD	OP.4 FDD
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB		dB 0 0	0	0
PHICH_RA	dB			
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA ^{Note3}				
OCNG_RB ^{Note3}				
N_{oc}	dBm/15 kHz	-98	-98	-98
\hat{E}_{s}/I_{ot}	dB	3	3	3
\hat{E}_s/N_{oc}	dB	3	3	3
lo ^{Note4}	dBm/9 MHz	-65.5	-65.5	N/A
IU	dBm/1.08 MHz	N/A	N/A	-74.7
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the reference measurement channels, see section A.3.1.

Note 2: For the OCNG pattern, see section A.3.2.

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: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 5: DRX related parameters are defined in Table A.7.1.1.1-3.

Table A.7.1.1.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Field	Test 1	Test 2	Test 3	Comment		
rieiu		Value				
srsBandwidthConfiguration	bw5	bw5	bw7			
srsSubframeConfiguration	sc1	sc3	sc1			
ackNackSrsSimultaneousTransmission	FALSE	FALSE	FALSE			
srsMaxUpPTS	N/A	N/A	N/A	Not applicable for FDD		
srsBandwidth	0	0	0	No hopping		
srsHoppingBandwidth	hbw0	hbw0	hbw0			
frequencyDomainPosition	0	0	0			
duration	TRUE	TRUE	TRUE	Indefinite duration		
Srs-ConfigurationIndex	0	77	0	SRS periodicity of 2ms and 80 ms for Test 1 and 2, respectively.		
transmissionComb	0	0	0			
cyclicShift	cs0	cs0	cs0	No cyclic shift		
Note: For further information see section 6.3.2 in 3GPP TS 36.331.						

Table A.7.1.1-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN FDD

Fi-1-1	Test2	Comment	
Field	Value		
onDurationTimer	psf1		
drx-InactivityTimer	psf1		
drx-RetransmissionTimer	psf1		
longDRX-CycleStartOffset	sf80		
shortDRX	disable		

A.7.1.1.2 Test Requirements

For parameters specified in Tables A.7.1.1.1-1 and A.7.1.1.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwith, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms (Tests 1 and 2, respectively):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+64 \times T_S$ (approximately $+2\mu s$) compared to that in (a).
- c) The test system shall verify that for Test 1 the adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for Test 2.
- d) The test system shall verify that the UE transmit timing offset stays within $N_{TA} \times T_S \pm 12 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

For the 1.4MHz channel bandwith, the test sequence shall be carried out in RRC_CONNECTED for non-DRX (Tests 3):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $N_{TA} \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+128 \times T_S$ (approximately $+4\mu s$) compared to that in (a).
- c) The test system shall verify that the adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within $N_{TA} \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- d) The test system shall verify that the UE transmit timing offset stays within $N_{TA} \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

A.7.1.2 E-UTRAN TDD - UE Transmit Timing Accuracy Tests

A.7.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in section 7.1.2.

For this test a single cell is used. Table A.7.1.2.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting sounding reference symbols using the configuration defined in Table A.7.1.2.1-2.

Table A.7.1.2.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Parameter	Unit		Value	
		Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth (BW _{channel})	MHz	10	10	1.4
Special subframe configuration Note1		6	6	6
Uplink-downlink configuration ^{Note2}		1	1	1
DRX cycle	ms	OFF	80 ^{Note7}	OFF
PDCCH/PCFICH/PHICH	1110	011	- 00	011
Reference measurement channel Note3		R.6 TDD	R.6 TDD	R.8 TDD
OCNG Pattern ^{Note4}		OP.2 TDD	OP.2 TDD	OP.4 TDD
PBCH_RA	dB	0	0	0
PBCH_RB				
PSS_RA				
SSS RA				
PCFICH_RB				
PHICH_RA		•		
PHICH_RB		0	0	0
PDCCH_RA				
PDCCH_RB				
OCNG_RA ^{Note5}				
OCNG_RB ^{Note5}				
N_{oc}	dBm/1 5 kHz	-98	-98	-98
\hat{E}_{s}/I_{ot}	dB	3	3	3
\hat{E}_s/N_{oc}	dB	3	3	3
	dBm/9 MHz	-65.5	-65.5	N/A
Io ^{Note6}	dBm/1 .08 MHz	N/A	N/A	-74.7
Propagation condition	-	AWGN	AWGN	AWGN

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.

Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.

Note 3: For the reference measurement channels, see section A.3.1.

Note 4: For the OCNG pattern, see section A.3.2.

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: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 7: DRX related parameters are defined in Table A.7.1.2.1-3.

Table A.7.1.2.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

Field	Test 1	Test 2	Tset3	Comment	
rieiu		Value	Comment		
srsBandwidthConfiguration	bw5	bw5	bw7		
srsSubframeConfiguration	sc3	sc3	sc3	Once every 5 subframes	
ackNackSrsSimultaneousTra nsmission	FALSE	FALSE	FALSE		
srsMaxUpPTS	FALSE	FALSE	FALSE		
srsBandwidth	0	0	0	No hopping	
srsHoppingBandwidth	hbw0	hbw0	hbw0		
frequencyDomainPosition	0	0	0		
duration	TRUE	TRUE	TRUE	Indefinite duration	
Srs-ConfigurationIndex	15	85	15	SRS periodicity of 10 and 80 ms for Test 1 and 2, respectively.	
transmissionComb	0	0	0		
cyclicShift	cs0	cs0	cs0	No cyclic shift	
Note: For further information see section 6.3.2 in 3GPP TS 36.331.					

Table A.7.1.2.1-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRAN TDD

Field	Test2	Comment			
Field	Value				
onDurationTimer	psf1				
drx-InactivityTimer	psf1				
drx-RetransmissionTimer	psf1				
longDRX-CycleStartOffset	sf80				
shortDRX	disable				
Note: For further information see section 6.3.2 in 3GPP TS 36.331.					

A.7.1.2.2 Test Requirements

For parameters specified in Tables A.7.1.2.1-1 and A.7.1.2.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwith, the test sequence shall be carried out in RRC_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms (Tests 1 and 2, respectively):

- a) After a connection is set up with the cell, the test system 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.
- b) The test system adjusts the downlink transmit timing for the cell by $+64 \times T_S$ (approximately $+2\mu s$) compared to that in (a).
- c) The test system shall verify that for test 1 the adjustment step size and the adjustment rate shall be according to the requirements in section 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. Skip this step for test 2.
- d) The test system 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.

For the 1.4MHz channel bandwith, the test sequence shall be carried out in RRC_CONNECTED for non-DRX (Tests 3):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within $(N_{TA}+624)\times T_S\pm 24\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by $+128 \times T_S$ (approximately $+4\mu s$) compared to that in (a).
- c) The test system shall verify that the adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within $(N_{TA}+624)\times T_S\pm 24\times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- d) The test system shall verify that the UE transmit timing offset stays within $(N_{TA} + 624) \times T_S \pm 24 \times T_S$ with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

A.7.2 UE Timing Advance

A.7.2.1 E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test

A.7.2.1.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN FDD Timing Advance adjustment accuracy requirements, defined in section 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.1.1-1, A.7.2.1.1-2, and A.7.2.1.1-3. 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), as specified in table A.7.2.1.1-3, 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.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element, as specified in Section 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Section 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements, with Timing Advance Command value specified in table A.7.2.1.1-2. This value shall result in changes of the timing advance used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Section 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Section 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

Table A.7.2.1.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
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	

Table A.7.2.1.1-2: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test

Parameter	Unit	Value
		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	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	
PDCCH_RA	dB	0
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note1}	dB	
OCNG_RB ^{Note1}	dB	
Timing Advance Command (T _A)		31 [39]
\hat{E}_{s}/I_{ot}	dB	3
N_{oc}	dBm/15 KHz	-98
\hat{E}_s/N_{oc}	dB	3
Io ^{Note2}	dBm/9 MHz	-65.5
Propagation Condition		AWGN

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

Note 2: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Table A.7.2.1.1-3: Sounding Reference Symbol Configuration for E-UTRAN FDD Transmit Timing Accuracy Test

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.					

A.7.2.1.2 Test Requirements

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 be within the limits specified in section 7.3.2.2.

The rate of correct Timing Advance adjustments observed during repeated tests shall be at least 90%.

A.7.2.2 E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test

A.7.2.2.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN TDD Timing Advance adjustment accuracy requirements, defined in section 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.2.1-1, A.7.2.2.1-2, and A.7.2.2.1-3. 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), as specified in table A.7.2.2.1-3, 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.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element, as specified in Section 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Section 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements, with Timing Advance Command value specified in table A.7.2.1.1-2. This value shall result in changes of the timing advance used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Section 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Section 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

Table A.7.2.2.1-1: 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.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
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	

Table A.7.2.2.1-2: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Value				
		T1	T2			
E-UTRA RF Channel Number			1			
BW _{channel}	MHz		10			
Special subframe configuration Note1			6			
Uplink-downlink configuration Note2			1			
OCNG Patterns defined in A.3.2.2.1			OP.1 TDD			
(OP.1 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB	1				
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB	0				
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note3}	dB					
OCNG_RB ^{Note3}	dB					
Timing Advance Command (T _A)		31	[39]			
\hat{E}_{s}/I_{ot}	dB		3			
N_{oc}	dBm/15 KHz	-98				
\hat{E}_s/N_{oc}	dB	3				
Io ^{Note4}	dBm/9 MHz	-65.5				
Propagation Condition			AWGN			

Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.

Table A.7.2.2.1-3: 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	15	SRS periodicity of 10ms.					
transmissionComb	0						
cyclicShift	cs0	No cyclic shift					
Note: For further information see section 6.3.2 in 3GPP TS 36.331.							

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: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

A.7.2.2.2 Test Requirements

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 be within the limits specified in section 7.3.2.2.

A.7.3 Radio Link Monitoring

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

A.7.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and 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 section 7.6.

The test parameters are given in Tables A.7.3.1.1-1, A.7.3.1.1-2 and A.7.3.1.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.1.1-4 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. 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.

Table A.7.3.1.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

Parameter		Unit		Va	Comment			
			Test 1	Test 2	Test 3	Test 4		
PCFICH/PDCCH/PHICH parameters			R.6 FDD	R.7 FDD	R.6 FDD	R.7 FDD	As specified in section A.3.1.2.1. None of the PDCCH are intended for the UE under test	
OCNG parame	eters		OP.2 FDD	OP.2 FDD	OP.2 FDD	OP.2 FDD	As specified in section A.3.2.1.2.	
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1	
CP length			Normal	Normal	Normal	Normal		
E-UTRA RF C	hannel Number		1	1	1	1	One E-UTRA FDD carrier frequency is used.	
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	10	10	10		
Correlation Ma Configuration	Correlation Matrix and Antenna		1x2 Low	2x2 Low	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212	
Out of sync transmission	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Qout and the	
parameters	Aggregation level	CCE	8	8	8	8	corresponding	
(Note 1)	ρ _A , ρ _B		0	-3	0	-3	hypothetical	
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	PDCCH/PCFICH transmission	
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	parameters are as specified in section 7.6.1 and Table 7.6.1-1 respectively.	
DRX			OFF	OFF	OFF	OFF		
Layer 3 filterin	g		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	CQI reporting periodicity		2	2	2	2	Minimum CQI reporting periodicity	
Propagation cl	Propagation channel		AWGN	AWGN	ETU 70 Hz	ETU 70 Hz		
T1		S	1	1	1	1		
T2		S	0.4	0.4	0.4	0.4		
T3		S	0.5	0.5	0.5	0.5		
Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the								

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.1.1-2: 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	T1 T2 T3		T1	T2	T3		
E-UTRA RF Channel			1		1				
Number									
BW _{channel}	MHz		10			10			
Correlation Matrix			1x2 Low			2x2 Low			
and Antenna									
Configuration									
OCNG Pattern									
defined in A.3.2.1			OP.2 FDD			OP.2 FDD			
(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								
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 1}	dB								
OCNG RB ^{Note 1}	dB								
SNR Note 6	dB	-4.7	-9.5	-13.5	-4.7	-9.5	-13.5		
N_{oc}	dBm/15	-98 -98							
	kHz								
Propagation condition			AWGN			AWGN			

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.1.1-4.

Table A.7.3.1.1-3: 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			1		1					
Number										
BW _{channel}	MHz		10			10				
Correlation Matrix			1x2 Low			2x2 Low				
and Antenna										
Configuration										
OCNG Pattern										
defined in A.3.2.1			OP.2 FDD			OP.2 FDD				
(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									
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 1}	dB									
OCNG RB ^{Note 1}	dB									
SNR Note 6	dB	-1.4	-5.5	-11.5	-2.3	-6.2	-12.2			
N_{oc}	dBm/15	-98		-98						
1 oc	kHz									
Propagation condition			ETU 70 Hz			ETU 70 Hz				

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal
- Note 6: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.1.1-4.

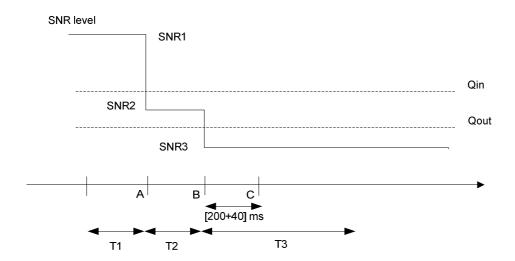


Figure A.7.3.1.1-4 SNR variation for out-of-sync testing

A.7.3.1.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During time duration T1 and T2 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 2 ms.

The UE shall stop reporting the CQI within 240 ms from the start of the time duration T3.

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

A.7.3.2 E-UTRAN FDD Radio Link Monitoring Test for In-sync

A.7.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and 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 section 7.6.

The test parameters are given in Tables A.7.3.2.1-1 and A.7.3.2.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.2.1-3 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. 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.

Table A.7.3.2.1-1: General test parameters for E-UTRAN FDD in-sync testing

Parameter		Unit	Va	lue	Comment			
1	arameter	Onne	Test 1	Test 2	Comment			
PCFICH/PDC0 parameters	PCFICH/PDCCH/PHICH parameters		R.6 FDD	R.7 FDD	As specified in section A.3.1.2.1. None of the PDCCH are intended for the UE under test			
OCNG parame	eters		OP.2 FDD	OP.2 FDD	As specified in section A.3.2.1.2.			
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1			
CP length			Normal	Normal				
	hannel Number		1	1	One E-UTRA FDD carrier frequency is used.			
E-UTRA Chan (BW _{channel})		MHz	10	10				
Correlation Ma Configuration	atrix and Antenna		1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2			
	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212			
In sync transmission	Number of Control OFDM symbols		2	2	In sync threshold Q _{in} and the corresponding			
parameters	Aggregation level	CCE	4	4	hypothetical			
(Note 1)	ρ _A , ρ _B		0	-3	PDCCH/PCFICH			
	Ratio of PDCCH to RS EPRE		0	-3	transmission parameters are as specified in section			
	Ratio of PCFICH to RS EPRE		4	1	and Table 7.6.1-2 respectively.			
	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212			
Out of sync transmission	Number of Control OFDM symbols		2	2	Out of sync threshold Q _{out} and the corresponding			
parameters	Aggregation level	CCE	8	8	hypothetical			
(Note 1)	ρ _A , ρ _B		0	-3	PDCCH/PCFICH transmission parameters			
	Ratio of PDCCH to RS EPRE	dB	4	1	are as specified in section 7.6.1 and Table 7.6.1-1			
	Ratio of PCFICH to RS EPRE	dB	4	1	respectively.			
DRX			OFF	OFF				
Layer 3 filterin	g 		Enabled	Enabled	Counters: N310 = 1; N311 = 1			
T310 timer		ms	2000	2000	T310 is enabled			
T311 timer		ms	1000	1000	T311 is enabled			
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.			
CQI reporting periodicity		ms	2	2	Minimum CQI reporting periodicity			
Propagation channel			ETU 70 Hz	ETU 70 Hz				
T1		S	0.5	0.5				
T2		S	0.4	0.4				
T3		S	1.46	1.46				
T4 T5		S	0.4	0.4				
	DCCH/PCFICH corr	S			sync transmission			
Note 1: PI	JUUH/PUFIUH CORR	espond	ina to the in-s\	inc and out of	SVIIC TRANSMISSION			

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.2.1-2: 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	l	T5	T1	T2	T3	T4	1	T5
E-UTRA RF Channel		1						1					
Number													
BW _{channel}	MHz			1	0			10					
Correlation Matrix				1x2	Low					2x2	2 Low	1	
and Antenna													
Configuration													
OCNG Pattern													
defined in A.3.2.1				OP.2	FDE)				OP.	2 FDI	D	
(FDD)													
ρ _A , ρ _B				C				-3					
PCFICH_RB	dB			4				1					
PDCCH_RA	dB			C				-3					
PDCCH_RB	dB			C				-3					
PBCH_RA	dB			`									
PBCH_RB	dB												
PSS_RA	dB												
SSS_RA	dB										_		
PHICH_RA	dB			C)						-3		
PHICH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA ^{Note 1}	dB												
OCNG RB ^{Note 1}	dB												
SNR Note 6	dB	-1.4	-5.5	-11	1.5	-6.4	-1.4	-2.3	-6.2	2 -	12.2	-7.3	-2.3
N_{oc}	dBm/15		•	-9	8		•		•		-98	•	•
1 oc	kHz												
Propagation condition			•	ETU 7	70 H	Z		ETU 70 Hz					

- Note 1: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 4: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 5: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.2.1-3.

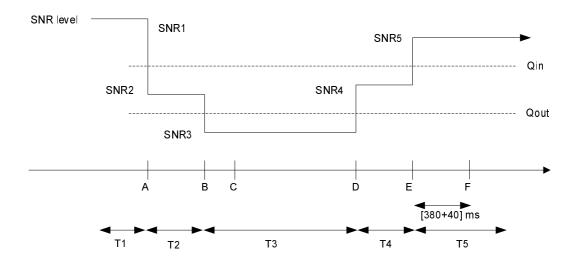


Figure A.7.3.2.1-3 SNR variation for in-sync testing

A.7.3.2.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During time duration T1, T2, T3, T4 and T5 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 2 ms.

If the UE stops reporting the CQI before Point F (420 ms after the start of the time duration T5), the UE fails the tests.

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

A.7.3.3 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync

A.7.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and 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 section 7.6.

The test parameters are given in Tables A.7.3.3.1-1, A.7.3.3.1-2 and A.7.3.3.1-3 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.3.1-4 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Table A.7.3.3.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Pa	rameter	Unit		Va	Comment		
			Test 1	Test 2	Test 3	Test 4	1
PCFICH/PDC0 parameters			R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended for the UE under test
OCNG parame	eters		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section A.3.2.2.2.
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	Normal	Normal	
	hannel Number		1	1	1	1	One E-UTRA TDD carrier frequency is used.
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	10	10	10	
Correlation Ma Configuration	trix and Antenna		1x2 Low	2x2 Low	1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1A	1A	1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
Out of sync transmission	Number of Control OFDM symbols		2	2	2	2	Out of sync threshold Q _{out} and the corresponding
parameters	Aggregation level	CCE	8	8	8	8	hypothetical
(Note 1)	ρ _A , ρ _B		0	-3	0	-3	PDCCH/PCFICH
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	transmission parameters are as specified in section
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	7.6.1 and Table 7.6.1-1 respectively.
DRX			OFF	OFF	OFF	OFF	
Layer 3 filtering	9		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	CQI reporting periodicity		1	1	1	1	Minimum CQI reporting periodicity
Propagation ch	nannel		AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		S	1	1	1	1	
T2		S	0.4	0.4	0.4	0.4	
T3	<u> </u>	S	0.5	0.5	0.5	0.5	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.3.1-2: 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	T1 T2 T3			T2	Т3	
E-UTRA RF Channel			1			1		
Number								
BW _{channel}	MHz		10			10		
Correlation Matrix			1x2 Low			2x2 Low		
and Antenna								
Configuration								
Special subframe configuration Note1			6			6		
Uplink-downlink			1			1		
configuration ^{Note2}								
OCNG Pattern								
defined in A.3.2.2			OP.2 TDD		OP.2 TDD			
(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							
SNR Note 8	dB	-5.1 -9.1 -13.1 -5.2 -9.2				-13.2		
N_{oc}	dBm/15		-98		-98			
	kHz							
Propagation condition		AWGN AWGN						

- Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.3.1-4.

Table A.7.3.3.1-3: 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	T1 T2 T3			T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix			1x2 Low			2x2 Low	
and Antenna							
Configuration							
Special subframe			6			6	
configuration Note1							
Uplink-downlink			1			1	
configuration Note2							
OCNG Pattern			0D 0 TDD			0D 0 TDD	
defined in A.3.2.2			OP.2 TDD		OP.2 TDD		
(TDD)			0			-3	
ρ _Α , ρ _Β PCFICH_RB	dB		4		1		
PDCCH_RA	dB		0		-3		
PDCCH_RB	dB		0		-3		
PBCH_RA	dB		U		-3		
PBCH_RB	dВ						
PSS_RA	dВ						
SSS_RA	dB						
PHICH_RA	dB		0		-3		
PHICH_RB	dB		· ·			Ū	
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 3}	dB						
OCNG RB ^{Note 3}	dB						
SNR Note 8	dB	-1.4	-1.4 -5.3 -11.3			-5.9	-11.9
	dBm/15		-98		-2.3	-98	
N_{oc}	kHz		30			30	
Propagation condition		ETU 70 Hz ETU 70 Hz					
Nata 4: Fautha ana		firmedian table 4.0.4 in CORD TO 00.044					

- Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 respectively in figure A.7.3.3.1-4.

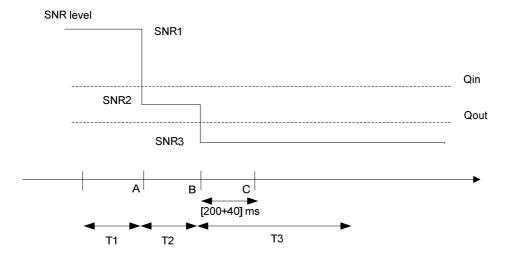


Figure A.7.3.3.1-4. SNR variation for out-of-sync testing

A.7.3.3.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

During time duration T1 and T2 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 1 ms.

The UE shall stop reporting the CQI within 240 ms from the start of the time duration T3.

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

A.7.3.4 E-UTRAN TDD Radio Link Monitoring Test for In-sync

A.7.3.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and 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 section 7.6.

The test parameters are given in Tables A.7.3.4.1-1 and A.7.3.4.1-2 below. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.4.1-3 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms.

Table A.7.3.4.1-1: General test parameters for E-UTRAN TDD in-sync testing

Pa	arameter	Unit	Va	lue	Comment		
		0	Test 1	Test 2			
PCFICH/PDC0	CH/PHICH		R.6 TDD	R.7 TDD	As specified in section		
parameters					A.3.1.2.2.		
·					None of the PDCCH are		
					intended for the UE under		
					test		
OCNG parame	eters		OP.2 TDD	OP.2 TDD	As specified in section A.3.2.2.2.		
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1		
CP length			Normal	Normal			
E-UTRA RF C	hannel Number		1	1	One E-UTRA FDD carrier frequency is used.		
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	10			
Correlation Ma	trix and Antenna		1x2 Low	2x2 Low	Correlation Matrix and		
Configuration					Antenna Configuration are		
					defined in TS 36.101 [5]		
	DCI format	<u> </u>	1C	1C	Annex B.2.3.2 As defined in section		
					5.3.3.1.4 in TS 36.212		
In sync transmission	Number of Control OFDM symbols		2	2	In sync threshold Q _{in} and the corresponding		
parameters	Aggregation level	CCE	4	4	hypothetical		
(Note 1)	ρ _A , ρ _B		0	-3	PDCCH/PCFICH		
	Ratio of PDCCH to RS EPRE		0	-3	transmission parameters are as specified in section		
	Ratio of PCFICH to RS EPRE		4	1	and Table 7.6.1-2 respectively.		
	DCI format		1A	1A	As defined in section		
					5.3.3.1.3 in TS 36.212		
Out of sync	Number of Control		2	2	Out of sync threshold Qout		
transmission	OFDM symbols				and the corresponding		
parameters (Note 1)	Aggregation level	CCE	8	8	hypothetical PDCCH/PCFICH		
(Note 1)	ρа, ρв		0	-3	transmission parameters		
	Ratio of PDCCH	dB	4	1	are as specified in section		
	to RS EPRE				7.6.1 and Table 7.6.1-1		
	Ratio of PCFICH to RS EPRE	dB	4	1	respectively.		
DRX	·		OFF	OFF			
Layer 3 filterin	g		Enabled	Enabled	Counters: N310 = 1; N311 = 1		
T310 timer		ms	2000	2000	T310 is enabled		
T311 timer	<u> </u>	ms	1000	1000	T311 is enabled		
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.		
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity		
Propagation channel			ETU 70 Hz	ETU 70 Hz			
T1		S	0.5	0.5			
T2		S	0.4	0.4			
T3		S	1.46	1.46			
T4		S	0.4	0.4			
T5	20011/2021011	S	<u> 1 </u>	1	<u> </u>		
Note 1: PI	DCCH/PCFICH corr	espond	ing to the in-sy	nc and out of	sync transmission		

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.4.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring tests # 1 and # 2

Parameter	Unit			Te	st 1			Test 2						
		T1	T2	T3	T4		T5	T1	T2	T3	3 7	Γ4	T	Γ5
E-UTRA RF Channel					1						1			
Number														
BW _{channel}	MHz			1	0			10						
Correlation Matrix				1x2	Low			2x2 Low						
and Antenna														
Configuration														
Special subframe				(6						6			
configuration Note1														
Uplink-downlink					1						1			
configuration Note2														
OCNG Pattern														
defined in A.3.2.2				OP.2	2 TDE)		OP.2 TDD						
(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													
SNR Note 8	dB	-1.4	-1.4 -5.3 -11.3 -6.4 -1.4			-2.3	-5.9	9	-11.9	-7	.3	-2.3		
N_{oc}	dBm/15			-(98			-98						
	kHz													
Propagation condition			ETU 70 Hz							ET	U 70	Hz		

- Note 1: For the special subframe configuration see table 4.2-1 in 3GPP TS 36.211.
- Note 2: For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211.
- Note 3: OCNG shall be used such that the resources in cell # 1 are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.
- Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period T1.
- Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- Note 8: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A.7.3.4.1-3.

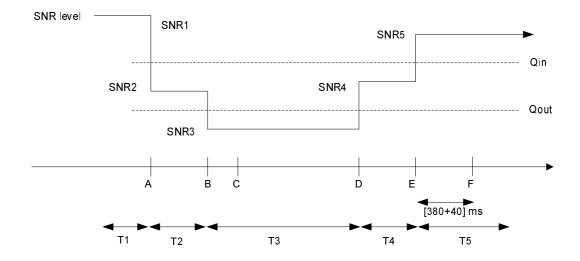


Figure A.7.3.4.1-3. SNR variation for in-sync testing

A.7.3.4.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During time duration T1, T2, T3, T4 and T5 the UE shall continuously report CQI according to the configured CQI mode (PUCCH 1-0) with a periodicity of 1 ms.

If the UE stops reporting the CQI before Point F (420 ms after the start of the time duration T5), the UE fails the tests.

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

A.7.3.5 E-UTRAN FDD Radio Link Monitoring Test for Out-of-sync in DRX

A.7.3.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.5.1-1, A.7.3.5.1-2, A.7.3.5.1-3 and A.7.3.5.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.5.1-5 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. 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. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.5.1-1: General test parameters for E-UTRAN FDD out-of-sync tests in DRX

Pa	Parameter Unit Value		Comment		
			Test 1	Test 2	
PCFICH/PDC	CH/PHICH		R.7 FDD	R.6 FDD	As specified in section
parameters					A.3.1.2.1.
					None of the PDCCH are
OCNG parame	otoro		OP.2 FDD	OP.2 FDD	intended for the UE under test As specified in section
•	eters				A.3.2.1.2.
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal	
E-UTRA RF C	hannel Number		1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Char (BW _{channel})	nel Bandwidth	MHz	10	10	nequency to accu.
Correlation Ma Configuration	atrix and Antenna		2x2 Low	1x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
Out of sync transmission parameters	Number of Control OFDM symbols		2	2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission
(Note 1)	Aggregation level	CCE	8	8	parameters are as specified in section 7.6.1 and Table 7.6.1-
	ρ_A, ρ_B		-3	0	1 respectively.
	Ratio of PDCCH to RS EPRE	dB	1	4	
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table A.7.3.5.1-3
Layer 3 filterin	g		Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
	eporting mode		PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting		ms	2	2	Minimum CQI reporting periodicity
Propagation c	hannel		ETU 70 Hz	AWGN	
T1		S	4	32	
T2		S	1.6	12.8	
T3		S	1.8	13	

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

REs.

respectively in figure A.7.3.5.1-5.

Note 6:

Table A.7.3.5.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2 in DRX

Parameter	Unit		Test 1		Test 2				
		T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel			1			1			
Number									
BW _{channel}	MHz		10		10				
Correlation Matrix			2x2 Low			1x2 Low			
and Antenna									
Configuration									
OCNG Pattern			00 0 500			00 0 500			
defined in A.3.2.1			OP.2 FDD			OP.2 FDD			
(FDD)									
ρ _Α , ρ _в			-3			0			
PCFICH_RB	dB		1			4			
PDCCH_RA	dB		-3			0			
PDCCH_RB	dB		-3		0				
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB		-3		0				
PHICH_RA	dB								
PHICH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA ^{Note1}	dB								
OCNG_RB ^{Note1}	dB								
SNR Note 6	dB	-2.3	-6.2	-12.2	-4.7	-9.5	-13.5		
N_{oc}	dBm/15 kHz		-98			-98			
Propagation condition		ETU 70 Hz AWGN							
Note 1: OCNG shall	be used such t	n that the resources in cell # 1 are fully allocated and a constant							
		er spectral density is achieved for all OFDM symbols.							
Note 2: The uplink reperiod T1.	esources for Co	CQI reporting are assigned to the UE prior to the start of time							
•	nd layer 3 filter	Itering related parameters are configured prior to the start of time							
	ontains PDCCI	CCH for UEs other than the device under test as part of OCNG.							
		to the signal to noise ratio over the cell-specific reference signal							

Table A.7.3.5.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3

Field	Test1	Test2	Comment
rieid	Value	Value	
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP
drx-InactivityTimer	psf1	psf1	TS 36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.7.3.5.1-4: TimeAlignmentTimer - Configuration for E-UTRAN FDD out-of-sync testing

Field	Test1	Test2	Comment
rieiu	Value	Value	
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

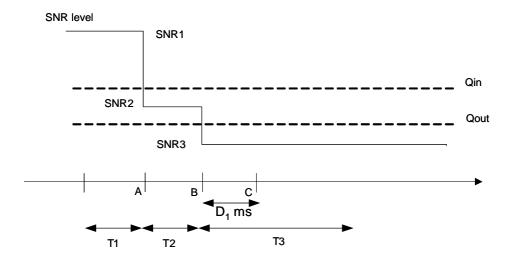


Figure A.7.3.5.1-5 SNR variation for out-of-sync testing in DRX

A.7.3.5.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In test 1 and test 2 during time duration T1 and T2 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

In test 1 the UE shall stop reporting the CQI within duration $D_1 = 900$ ms from the start of the time duration T3.

In test 2 the UE shall stop reporting the CQI within duration $D_1 = 6500$ ms from the start of the time duration T3.

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

A.7.3.6 E-UTRAN FDD Radio Link Monitoring Test for In-sync in DRX

A.7.3.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN FDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.6.1-1, A.7.3.6.1-2, A.7.3.6.1-3 and A.7.3.6.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.6.1-5 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. 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. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.6.1-1: General test parameters for E-UTRAN FDD in-sync test in DRX

Param	neter	Unit	Value	Comment
PCFICH/PDCCH/PHIC	CH parameters		R.6 FDD	As specified in section A.3.1.2.1. None of the PDCCH are intended for the UE under test
OCNG parameters			OP.2 FDD	As specified in section A.3.2.1.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	
E-UTRA RF Channel N			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Band		MHz	10	
Correlation Matrix and Configuration	Antenna		1x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
In sync transmission parameters	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical
(Note 1)	Aggregation level	CCE	4	PDCCH/PCFICH transmission
	ρ _A , ρ _B		0	parameters are as specified in
	Ratio of PDCCH to RS EPRE		0	section and Table 7.6.1-2 respectively.
	Ratio of PCFICH to RS EPRE		4	
	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
Out of sync transmission	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical
parameters	Aggregation level	CCE	8	PDCCH/PCFICH transmission
(Note 1)	ρ_A , ρ_B		0	parameters are as specified in section 7.6.1 and Table 7.6.1-1
	Ratio of PDCCH to RS EPRE	dB	4	respectively.
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table A.7.3.6.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		S	4	
T2		S	1.6	
T3		S	1.46	
T4 T5		S	0.4	
ıυ		٥	4	1

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.6.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for in-sync radio link monitoring test # 1 in DRX

Parameter	Unit			Test 1				
		T1	T2	T3	T4	T5		
E-UTRA RF Channel Number		1						
BW _{channel}	MHz	10						
Correlation Matrix and				1x2 Low				
Antenna Configuration								
OCNG Pattern defined in								
A.3.2.1 (FDD)				OP.2 FDD				
ρα, ρв				0				
PCFICH_RB	dB			4				
PDCCH_RA	dB			0				
PDCCH_RB	dB			0				
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB							
PHICH_RA	dB			0				
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note1}	dB							
OCNG_RB ^{Note1}	dB							
SNR Note 8	dB	-4.7	-9.5	-13.5	-8.7	-4.7		
N_{oc}	dBm/15			-98				
1 oc	kHz							
Propagation condition				AWGN				
Note 1: OCNG shall be used	such that the	resources in	cell # 1 are f	ully allocated	and a consta	nt total		
transmitted power sp								
		CQI reporting are assigned to the UE prior to the start of time period T1.						

- The timers and layer 3 filtering related parameters are configured prior to the start of time period Note 3:
- The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 4:
- SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs. Note 5:
- Note 6: The SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and

SNR5 respectively in figure A.7.3.6.1-5.

Table A.7.3.6.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP
drx-InactivityTimer	psf1	TS 36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40	
shortDRX	disable	

Table A.7.3.6.1-4: TimeAlignmentTimer - Configuration for E-UTRAN FDD out-of-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

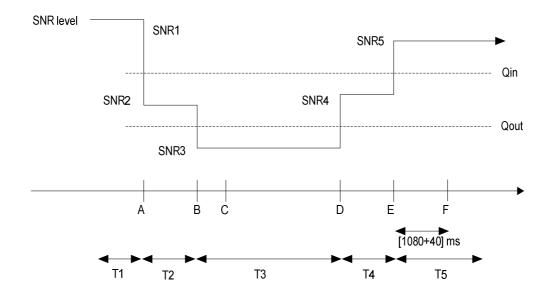


Figure A.7.3.6.1-5 SNR variation for in-sync testing in DRX

A.7.3.6.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the entire test from time period T1 to T5 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

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

A.7.3.7 E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync in DRX

A.7.3.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.7.1-1, A.7.3.7.1-2, A.7.3.7.1-3 and A.7.3.7.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Figure A.7.3.7.1-5 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.7.1-1: General test parameters for E-UTRAN TDD out-of-sync tests in DRX

Parameter		Unit	Va	lue	Comment	
			Test 1	Test 2		
PCFICH/PDC0 parameters	CH/PHICH		R.7 TDD	R.6 TDD	As specified in section A.3.1.2.2. None of the PDCCH are	
OCNG parameters			OP.2 TDD	OP.2 TDD	intended for the UE under test As specified in section A.3.2.2.2.	
Active cell			Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1	
CP length			Normal	Normal		
E-UTRA RF C	hannel Number		1	1	One E-UTRA TDD carrier frequency is used.	
E-UTRA Chan (BW _{channel})	nel Bandwidth	MHz	10	10		
Correlation Ma Configuration	atrix and Antenna		2x2 Low	1x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2	
	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212	
Out of sync transmission parameters	Number of Control OFDM symbols		2	2	Out of sync threshold Q _{out} and the corresponding hypothetical PDCCH/PCFICH transmission	
(Note 1)	Aggregation level	CCE	8	8	parameters are as specified in section 7.6.1 and Table 7.6.1-	
	ρ_A , ρ_B		-3	0	1 respectively.	
	Ratio of PDCCH to RS EPRE	dB	1	4		
	Ratio of PCFICH to RS EPRE	dB	1	4		
DRX cycle		ms	40	1280	See Table A.7.3.7.1-3	
Layer 3 filterin	g		Enabled	Enabled	Counters: N310 = 1; N311 = 1	
T310 timer		ms	0	0	T310 is disabled	
T311 timer		ms	1000	1000	T311 is enabled	
	eporting mode		PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.	
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity	
Propagation channel			ETU 70 Hz	AWGN		
T1		S	4	32		
T2		S	1.6	12.8		
T3		S	1.8	13		

Note 1: PDCCH/PCFICH corresponding to the out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.7.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 1 and # 2 in DRX

Parameter	Unit	Test 1			Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel		1			1		
Number							
BW _{channel}	MHz		10			10	
Correlation Matrix			2x2 Low			1x2 Low	
and Antenna							
Configuration							
Special subframe			6			6	
configuration Note1							
Uplink-downlink			1			1	
configuration Note2							
OCNG Pattern			OD 0 TD 0			OD 0 TO 0	
defined in A.3.2.2			OP.2 TDD	1	OP.2 TDD		
(TDD)		-3		0			
ρ _A , ρ _B PCFICH_RB	dB		_ - 3 1		4		
PDCCH_RA	<u>ив</u> dВ				0		
PDCCH_RB	<u>ив</u> dВ		-3 -3		0		
PBCH_RA	dB		-S		<u> </u>		
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PHICH_RA	dB		-3		0		
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note3}	dB						
OCNG RB ^{Note3}	dB						
SNR Note 8	dB	-2.3 -5.9 -11.9			-5.1	-9.1	-13.1
N_{oc}	dBm/15	-98				•	
¹ voc	kHz						
Propagation condition			ETU 70 Hz	7		AWGN	
Note 1: For the speci	al subframe co	onfiguratio	n see table	4.2-1 in 30	SPP TS 36	5.211.	

- For the uplink-downlink configuration see table 4.2-2 in 3GPP TS 36.211. Note 2:
- 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.
- The uplink resources for CQI reporting are assigned to the UE prior to the start of time Note 4: period T1.
- The timers and layer 3 filtering related parameters are configured prior to the start of time Note 5: period T1.
- The signal contains PDCCH for UEs other than the device under test as part of OCNG. Note 6:
- Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs.
- The SNR in time periods T1, T2 and T3 is denoted as SNR1, SNR2 and SNR3 Note 8: respectively in figure A.7.3.7.1-5.

Table A.7.3.7.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync tests

Field	Field Test1 Test2 Value Value		Comment
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP
drx-InactivityTimer	psf1	psf1	TS 36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.7.3.7.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD out-of-sync testing

Field	Test1 Value	Test2 Value	Comment
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

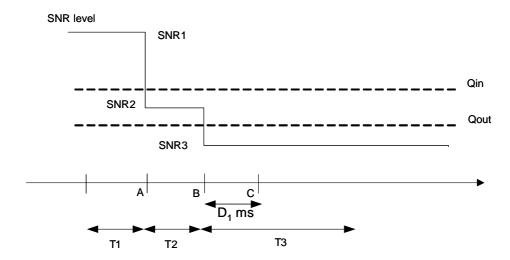


Figure A.7.3.7.1-5 SNR variation for out-of-sync testing in DRX

A.7.3.7.2 Test Requirements

The UE behaviour in each test during time durations T1, T2 and T3 shall be as follows:

In test 1 and test 2 during time duration T1 and T2 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

In test 1 the UE shall stop reporting the CQI within duration $D_1 = 900$ ms from the start of the time duration T3.

In test 2 the UE shall stop reporting the CQI within duration $D_1 = 6500$ ms from the start of the time duration T3.

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

A.7.3.8 E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX

A.7.3.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE properly detects the out of sync and in sync for the purpose of monitoring downlink radio link quality of the serving cell when DRX is used. This test will partly verify the E-UTRAN TDD radio link monitoring requirements in section 7.6.

The test parameters are given in Tables A.7.3.8.1-1, A.7.3.8.1-2, A.7.3.8.1-3 and A.7.3.8.1-4. There is one cell (cell 1), which is the active cell, in the test. The test consists of five successive time periods, with time duration of T1, T2, T3, T4 and T5 respectively. Figure A.7.3.8.1-5 shows the variation of the downlink SNR in the active cell to emulate out-of-sync and in-sync states. Prior to the start of the time duration T1, the UE shall be fully synchronized to cell 1. The UE shall be configured for periodic CQI reporting in PUCCH 1-0 mode with a reporting periodicity of 1 ms. In the test, DRX configuration is enabled and DRX inactivity timer has already been expired, i.e. UE tries to decode PDCCH and to send periodic CQI during the period when On-duration timer is running. Time alignment timers shall be set to "infinity" so that UL timing alignment is maintained during the test.

Table A.7.3.8.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX

Param	neter	Unit	Value	Comment
PCFICH/PDCCH/PHIC	CH parameters		R.6 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended
				for the UE under test
OCNG parameters			OP.2 TDD	As specified in section A.3.2.2.2.
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel
				number 1
CP length			Normal	
E-UTRA RF Channel N	Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Ban	dwidth (BW _{channel})	MHz	10	
Correlation Matrix and Configuration	Antenna		1x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
	DCI format		1C	As defined in section 5.3.3.1.4 in TS 36.212
In sync transmission parameters	Number of Control OFDM symbols		2	In sync threshold Q _{in} and the corresponding hypothetical
(Note 1)	Aggregation level	CCE	4	PDCCH/PCFICH transmission
	ρ _A , ρ _B		0	parameters are as specified in
	Ratio of PDCCH to RS EPRE		0	section and Table 7.6.1-2 respectively.
	Ratio of PCFICH to RS EPRE		4	
	DCI format		1A	As defined in section 5.3.3.1.3 in TS 36.212
Out of sync transmission	Number of Control OFDM symbols		2	Out of sync threshold Q _{out} and the corresponding hypothetical
parameters	Aggregation level	CCE	8	PDCCH/PCFICH transmission
(Note 1)	ρ _A , ρ _B		0	parameters are as specified in section 7.6.1 and Table 7.6.1-1
	Ratio of PDCCH to RS EPRE	dB	4	respectively.
	Ratio of PCFICH to RS EPRE	dB	4	
DRX cycle		ms	40	See Table A.7.3.8.1-3
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	2000	T310 is enabled
T311 timer		ms	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity
Propagation channel			AWGN	
T1		S	4	
T2		S	1.6	
T3		S	1.46	
T5		S	0.4	
10	S	4		

Note 1: PDCCH/PCFICH corresponding to the in-sync and out of sync transmission parameters need not be included in the Reference Measurement Channel.

Table A.7.3.8.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio link monitoring test # 1 in DRX

Parameter	Unit			Test 1				
		T1	T2	T3	T4	T5		
E-UTRA RF Channel Number				1				
BW _{channel}	MHz	10						
Correlation Matrix and				1x2 Low				
Antenna Configuration								
Special subframe				6				
configuration Note1								
Uplink-downlink				1				
configuration Note2								
OCNG Pattern defined in				000 700				
A.3.2.2 (TDD)				OP.2 TDD				
ра, рв				0				
PCFICH_RB	dB	4						
PDCCH_RA	dB	0						
PDCCH_RB	dB			0				
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB	-						
SSS_RA	dB	0						
PHICH_RA	dB			U				
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note3}	dB							
OCNG_RB ^{Note3} SNR ^{Note 8}	dB	<i></i>	0.4	40.4	0.4	<i></i>		
SINK	dB	-5.1	-9.1	-13.1	-9.1	-5.1		
N_{oc}	dBm/15 kHz	-98						
Propagation condition				AWGN				
Note 1: For the special subfr								
Note 2: For the uplink-downl								
Note 3: OCNG shall be used					and a consta	ınt total		
transmitted power sp	ectral density	is achieved f	or 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
- 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 SNR in time periods T1, T2, T3, T4 and T5 is denoted as SNR1, SNR2, SNR3, SNR4 and Note 8:
 - SNR5 respectively in figure A.7.3.8.1-5.

Table A.7.3.8.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync tests

Field	Value	Comment
onDurationTimer	psf2	As specified in section 6.3.2 in 3GPP
drx-InactivityTimer	psf1	TS 36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf40]
shortDRX	disable	

Table A.7.3.8.1-4: TimeAlignmentTimer - Configuration for E-UTRAN TDD out-of-sync testing

Field	Value	Comment
TimeAlignmentTimer	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

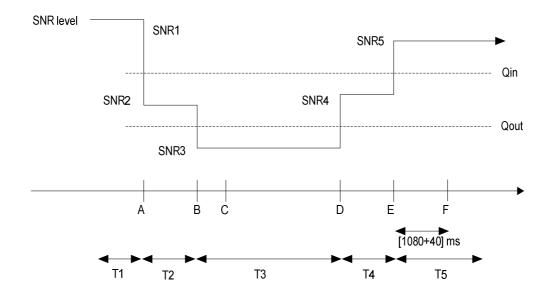


Figure A.7.3.8.1-5 SNR variation for in-sync testing in DRX

A.7.3.8.2 Test Requirements

The UE behaviour in each test during time durations T1, T2, T3, T4 and T5 shall be as follows:

During the entire test from time period T1 to T5 the UE shall report CQI according to the configured CQI mode (PUCCH 1-0) once every DRX cycle.

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

A.8 UE Measurements Procedures

The reference channels in this section assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.

A.8.1 E-UTRAN FDD Intra-frequency Measurements

A.8.1.1 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

A.8.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in section 8.1.2.2.1.1.

The test parameters are given in Table A.8.1.1.1-1 and A.8.1.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.1.1-1: 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	As specified in section A.3.1.1.1
		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel		1	One FDD carrier frequency is used.
Number			
Channel Bandwidth	MHz	10	
(BW _{channel})			
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	Ce	ell 1		Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel			1	1			
Number							
BW _{channel}	MHz	Ŷ	10		10		
OCNG Patterns							
defined in A.3.2.1.1		OP.1	I FDD	OI	P.2 FDD		
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB		_	0			
PHICH_RA	dB		0				
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						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46		
$N_{oc}^{ m Note~3}$	dBm/15 KHz	-		-98			
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4		
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94		
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94		
Propagation Condition			E ⁻	TU70			

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.

A.8.1.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.2 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD intra-frequency cell search requirements in section 8.1.2.2.1.1

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_{ac} 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 test parameters are given in Table A.8.1.2.1-1 and A.8.1.2.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.1.2.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency 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 section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel		1	One FDD carrier frequency is used.
Number			
Channel Bandwidth	MHz	10	
(BW _{channel})			
A3-Offset	dB	-6	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in section A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	

Table A.8.1.2.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Ce	II 1		Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		•	1		1		
Number							
BW _{channel}	MHz	1	0		10		
OCNG Patterns							
defined in A.3.2.1.1		OP.1	FDD	OP	.2 FDD		
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB		_				
PHICH_RA	dB	0			0		
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						
$\hat{ extsf{E}}_{ extsf{s}}/ extsf{I}_{ ext{ot}}$	dB	4	-1.46	-Infinity	-1.46		
$N_{oc}^{ m Note 3}$	dBm/15 KHz	,		-98			
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4		
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94		
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94		
Propagation Condition			E	TU70			
							

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.

A.8.1.2.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.1.3 E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

A.8.1.3.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the FDD-FDD intra-frequency cell search in DRX requirements in section 8.1.2.2.1.2.

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_{ac} 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 test parameters are given in Tables A.8.1.3.1-1, A.8.1.3.1-2, A.8.1.3.1-3 and A.8.1.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.1.3.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Parameter Unit Value		Comment	
		Test 1	Test 2	
PDSCH parameters		DL Reference Me	easurement	As specified in section A.3.1.1.1
		Channel R.0 FDI)	
PCFICH/PDCCH/PHICH		DL Reference Me	easurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDI)	
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel		1		One FDD carrier frequency is used.
Number				
Channel Bandwidth	MHz	10		
(BW _{channel})				
A3-Offset	dB	-6		
CP length		Normal		
Hysteresis	dB	0		
Time To Trigger	S	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in
				Table A.8.1.3.1-3
Time offset between cells		3 μs		Synchronous cells
T1	S	5	•	
T2	S	5	30	

Table A.8.1.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Ce	II 1		Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		•	1	1			
Number							
BW _{channel}	MHz	1	0		10		
OCNG Patterns							
defined in A.3.2.1.1		OP.1	FDD	OP	.2 FDD		
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB			0			
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						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46		
$N_{oc}^{ m Note 2}$	dBm/15 KHz			-98			
\hat{E}_s/N_{oc}	dB	4 4		-Infinity	4		
RSRP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94		
SCH_RP Note 3	dBm/15 KHz	-94	-94	-Infinity	-94		
Propagation Condition				TU70	•		

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

Table A.8.1.3.1-3: DRX-Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in
drx-InactivityTimer	psf1	psf1	3GPP TS 36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.1.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
Field	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

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

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

A.8.1.3.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the

measurement reporting delays above because UE is allowed to delay the initiation of the measurement

reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received

correct Event A3 measurement report.

A.8.1.4 Void

A.8.1.5 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

A.8.1.5.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in section 8.1.2.2.3.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.5.1-1 and A.8.1.5.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN 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. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

Table A.8.1.5.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
CP length		Normal	
A3-Offset	dB	-3	
Hysteresis	dB	0	
Time To Trigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	s	5	
T2	s	≤10	
T3	s	5	

Table A.8.1.5.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	Т3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0			0	
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						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz			-6	98		
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition			•	AW	'GN		

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.

A.8.1.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay +\ T_{identify_CGI,intra} + reporting\ delay$

= 15 + [150] + 2ms from the start of T3

= [167] ms, allow [170] ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until [170] ms at least [80] ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall [80] ACK/NACK number is caused by two parts. Firstly, at least [60] ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Section 8.1.2.2.3.1. Secondly, given that continuous DL data allocation, additional [20] ACK/NACK shall be sent from the start of T3 until [170] ms excludes [150] ms for identifying the cell global identifier of cell 2.

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_{ac} to be fulfilled.

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

A.8.1.6 E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

A.8.1.6.1 Test Purpose and Environment

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in section 8.1.2.2.3. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA FDD carrier and two cells as given in tables A.8.1.6.1-1, A.8.1.6.1-2, A.8.1.6.1-3 and A.8.1.6.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.1.6.1-1: General test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Unit	Value	Comment
	DL Reference Measurement	As specified in section A.3.1.1.1
	Channel R.0 FDD	
	DL Reference Measurement	As specified in section A.3.1.2.1
	Channel R.6 FDD	-
	Cell 1	
	Cell 2	Cell to be identified.
	1	Only one FDD carrier frequency is
		used.
MHz	10	
	Normal	
dB	-3	
dB	0	
s	0	
	0	L3 filtering is not used
	ON	DRX related parameters are
		defined in Table A.8.1.6.1-3
	TRUE	As specified in section 5.5.3.1 in
		TS 36.331.
ms	3	Asynchronous cells
s	5	
s	≤30	UE should report cell within 25.6s
		(20 DRX cycles)
s	5	
	MHz dB dB s	DL Reference Measurement Channel R.0 FDD

Table A.8.1.6.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	Т3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0			0	
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						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N_{oc} Note 2	dBm/15 KHz			-6	98		
\hat{E}_s/N_{oc}	dB	8	8	8	-Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition			•	AW	'GN		

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

Table A.8.1.6.1-3: DRX configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in
drx-InactivityTimer	psf1	3GPP TS 36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.1.6.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	sf1280	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

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_{ac} to be fulfilled.

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

A.8.1.6.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

 $Test \ requirement \ = RRC \ Procedure \ delay + \ T_{identify_CGI,intra} + reporting \ delay$

= 15 + [150] + 2ms from the start of T3

= [167] ms, allow [170] ms.

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

A.8.2 E-UTRAN TDD Intra-frequency Measurements

A.8.2.1 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD intra-frequency cell search requirements in section 8.1.2.2.2.1.

The test parameters are given in Table A.8.2.1.1-1 and A.8.2.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.2.1.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.0 TDD	As specified in section A.3.1.1.2
		DL Reference Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in section A.3.1.2.2
parameters			
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10	
A3-Offset	dB	-6	
CP length		Normal	
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
			The same configuration in both cells
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211.
			The same configuration in both cells
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX_L	As specified in section A.3.3
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	5	

Table A.8.2.1.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Unit Cell 1			Cell 2		
		T1	T2	T1	T1 T2		
E-UTRA RF Channel			1	1			
Number							
BW _{channel}	MHz		10		10		
OCNG Pattern defined							
in A.3.2.2.1 (OP.1		OP.	1 TDD	OP	.2 TDD		
TDD) and in A.3.2.2.2							
(OP.2)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0		0		
PHICH_RB	dB		U	U			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note~3}$	dBm/15 kHz			-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4		
Propagation Condition			· E	TU70			

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.

A.8.2.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.2.2 E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells with DRX

A.8.2.2.1 Test Purpose and Environment

The purpose of the two tests is to verify that the UE makes correct reporting of an event in DRX. The tests will partly verify the TDD-TDD intra-frequency cell search in DRX requirements in section 8.1.2.2.1.2.

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 test parameters are given in Tables A.8.1.3.1-1, A.8.1.3.1-2, A.8.1.3.1-3 and A.8.1.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.2.2.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	Unit	Value		Comment
		Test 1	Test 2	7
		DL Reference Measurement		
PDSCH parameters		Channel R.0 TDD		As specified in section A.3.1.1.2
		DL Reference Measurement		
PCFICH/PDCCH/PHICH		Channel R.6 TDD		As specified in section A.3.1.2.2
Parameters Active cell		Cell 1		
		Cell 2		Call to be identified
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel Number		1		One TDD carrier frequency is used.
Channel Bandwidth (BW _{channel})	MHz	10		
A3-Offset	dB	-6		
CP length		Normal		
Special subframe configuration		6		As specified in table 4.2-1 in TS 36.211.
				The same configuration in both cells
Uplink-downlink configuration		1		As specified in table 4.2-2 in TS 36.211.
				The same configuration in both cells
Hysteresis	dB	0		
Time To Trigger	S	0		
Filter coefficient		0		L3 filtering is not used
DRX		ON		DRX related parameters are defined in
				Table A.8.2.2.1-3
Time offset between cells		3 μs		Synchronous cells
T1	S	5		
T2	s	5	30	

Table A.8.2.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

Parameter	er Unit Cell 1		II 1	Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1		1		
Number						
BW _{channel}	MHz	10		10		
OCNG Pattern defined						
in A.3.2.2.1 (OP.1		OP.1 TDD		OP.2 TDD		
TDD) and in A.3.2.2.2						
(OP.2)						
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					
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98				
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_{s}/I_{ot}	dB	4	-1.46	-Infinity	-1.46	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-94	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	4	
Propagation Condition			E	TU70	•	

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

Table A.8.2.2.1-3: DRX-Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
rieid	Value	Value	
onDurationTimer	psf1	psf1	As specified in section 6.3.2 in
drx-InactivityTimer	psf1	psf1	3GPP TS 36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

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

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

Table A.8.2.2.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN TDD-TDD intra-frequency event triggered reporting in DRX under fading propagation conditions in synchronous cells

Field	Test1	Test2	Comment
	Value	Value	
TimeAlignmentTimer	sf500	sf500	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section 10.1 in 3GPP TS 36.213.

A.8.2.2.2 Test Requirements

In Test 1, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 800 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE send the measurement report on PUSCH.

In Test 2, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 25600 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.

NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.3 E-UTRAN FDD - FDD Inter-frequency Measurements

A.8.3.1 E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

A.8.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

The test parameters are given in Tables A.8.3.1.1-1 and A.8.3.1.1-2. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.3.1.1-1: 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.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
E-UTRA RF Channel		1, 2	Two FDD carrier frequencies are used.
Number			
Channel Bandwidth	MHz	10	
(BW _{channel})			
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section
			8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

Table A.8.3.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Co	ell 1	C	Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel			1	2			
Number							
BW _{channel}	MHz		10		10		
OCNG Patterns							
defined in A.3.2.1.1		OP.	1 FDD	OP.	.2 FDD		
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB			0			
PCFICH_RB	dB						
PHICH_RA	dB		•				
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
Propagation Condition				ETU70			

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

A.8.3.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.3.2 E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in asynchronous cells

A.8.3.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These test will partly verify the FDD-FDD inter-frequency cell search requirements when DRX is used in section 8.1.2.3.

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 common test parameters are given in Tables A.8.3.2.1-1 and A.8.3.2.1-2. DRX configuration for Test1 and Test2 are given in Table A.8.3.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.3.2.1-4. In this tests, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The tests 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 A.8.3.2.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1 Test 2		Comment		
		Value				
PDSCH parameters		DL Reference Measurement		As specified in section A.3.1.1.1 Note that		
		Channel R.0 FDD		UE may only be allocated at On Duration		
PCFICH/PDCCH/PHICH		DL Reference Me	asurement	As specified in section A.3.1.2.1.		
parameters		Channel R.6 FDD)			
E-UTRA RF Channel		1,	2	Two FDD carrier frequencies are used.		
Number						
Channel Bandwidth	MHz	1	0			
(BW _{channel})						
Active cell		Ce	II 1	Cell 1 is on RF channel number 1		
Neighbour cell		Ce	II 2	Cell 2 is on RF channel number 2		
Gap Pattern Id		()	As specified in 3GPP TS 36.133 section		
				8.1.2.1.		
A3-Offset	dB	-(6			
Hysteresis	dB	0				
CP length		Normal				
TimeToTrigger	S	0				
Filter coefficient		()	L3 filtering is not used		
PRACH configuration		4	1	As specified in table 5.7.1-2 in TS 36.211		
Access Barring Information	-	Not :	Sent	No additional delays in random access		
-				procedure.		
DRX		ON		ON		DRX related parameters are defined in
				Table A.8.3.2.1-3		
Time offset between cells		3 r	ns	Asynchronous cells		
T1	S	5	5			
T2	S	5	30			

Table A.8.3.2.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Ce	ell 1	Ce	Cell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel			1		2		
Number							
BW _{channel}	MHz	1	0	1	0		
OCNG Patterns							
defined in A.3.2.1.1		OP.1	FDD	OP.2	P FDD		
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB			0			
PHICH_RA	dB		•				
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
N _{oc} Note 2	dBm/15 kHz			-98			
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91		
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7		
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
Propagation Condition				ETU70			

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

Table A.8.3.2.1-3: drx-Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment				
rieiu	Value	Value					
onDurationTimer	psf1	psf1					
drx-InactivityTimer	psf1	psf1					
drx-RetransmissionTimer	psf1	psf1					
longDRX-CycleStartOffset	sf40	sf1280					
shortDRX	disable	disable					
Note: For further information see section 6.3.2 in 3GPP TS 36.331.							

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

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

Table A.8.3.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN FDD-FDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
Field	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213

A.8.3.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

A.8.3.3 E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

A.8.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX when L3 filtering is used. This test will partly verify the FDD-FDD inter-frequency cell search in DRX requirements in section 8.1.2.3.1.2 and the UE behaviour with the *filterCoefficent* defined in [2].

The test parameters are given in Tables A.8.3.3.1-1, A.8.3.3.1-2, A.8.3.3.1-3 and A.8.3.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 1 as defined in Table 8.1.2.1-1 is provided.

The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.3.3.1-1: General test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are defined in Table A.8.3.3.1-3
Time offset between cells		3 ms	Asynchronous cells
T1	S	30	
T2	S	7	

Table A.8.3.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD inter-frequency event triggered reporting under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Parameter	Unit	Ce	II 1	Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		•		2		
Number						
BW _{channel}	MHz	1	0		10	
OCNG Patterns						
defined in A.3.2.1.1		OP 1	FDD	OP	.2 FDD	
(OP.1 FDD) and in		01.1	וטט		.2 1 00	
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB			0		
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					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	4	24	
$N_{oc}^{ m Note~2}$	dBm/15 KHz	•		-98		
\hat{E}_s/N_{oc}	dB	4	4	4	24	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-74	
SCH_RP Note 3	dBm/15 KHz	-94	-94	-94	-74	
Propagation Condition			A	WGN	•	
N + 4 00NO 1 III	Larrate de at le ade a alla a e			1.4 244 1		

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

Table A.8.3.3.1-3: DRX-Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in
drx-InactivityTimer	psf1	3GPP TS 36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.3.3.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD-FDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions in asynchronous cells with DRX when L3 filtering is used

Field	Value	Comment
Time AlignmentTimes	sf500	As specified in section 6.3.2 in
TimeAlignmentTimer	\$1500	3GPP TS 36.331
		For further information see section
sr-ConfigIndex	0	6.3.2 in 3GPP TS 36.331 and
		section10.1 in 3GPP TS 36.213.

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_{ac} to be fulfilled.

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

A.8.3.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

A.8.3.4 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in section 8.1.2.3.5.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.8.3.4.1-1 and A.8.3.4.1-2. PDCCHs indicating new transmissions should be sent continuously to ensure that the UE would have ACK/NACK sending during identifying a new CGI of E-UTRAN 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. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

Table A.8.3.4.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Value	Comment		
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1		
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1		
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.		
Channel Bandwidth (BW _{channel})	MHz	10			
Active cell		Cell 1	Cell 1 is on RF channel number 1.		
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.		
CP length		Normal			
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.		
A3-Offset	dB	-6			
Hysteresis	dB	0			
TimeToTrigger	s	0			
Filter coefficient		0	L3 filtering is not used		
DRX		OFF			
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331.		
Time offset between cells	ms	3	Asynchronous cells		
T1	S	5			
T2	S	≤10			
T3	s	5			

Table A.8.3.4.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1		2		
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0			0	
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	4	4	-Infinity	7	7
Noc Note 2	dBm/15 KHz	-98					
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition				AW	'GN		
N. (4 00NO 1 III 1	1 4 4 1 4 1						

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.

A.8.3.4.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

 $Test\ requirement = RRC\ Procedure\ delay +\ T_{identify_CGI,inter} + reporting\ delay$

= 15 + [150] + 2ms from the start of T3

= [167] ms, allow [170] ms.

The UE shall be scheduled continuously throughout the test, and from the start of T3 until [170] ms at least [80] ACK/NACK shall be detected as being transmitted by the UE.

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

NOTE: The overall [80] ACK/NACK number is caused by two parts. Firstly, at least [60] ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Section 8.1.2.3.5.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional [20] ACK/NACK shall be sent from the start of T3 until [170] ms excludes [150] ms for identifying the cell global identifier of cell 2.

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_{ac} to be fulfilled.

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

A.8.3.5 E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

This test is to verify the requirement for identification of a new CGI of E-UTRA cell with autonomous gaps in section 8.1.2.3.5. The requirement is verified in a DRX configuration.

The test scenario comprises of two E-UTRA FDD carriers and one cell on each carrier as given in tables A.8.3.5.1-1, A.8.3.5.1-2, A.8.3.5.1-3 and A.8.3.5.1-4. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of cell 2. Starting T2, cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-frequency monitoring.

A RRC message implying SI reading shall be sent to the UE during period T2, after the UE has reported Event A3. The RRC message shall create a measurement report configuration with purpose *reportCGI* and *si-RequestForHO* set to TRUE. The start of T3 is the instant when the last TTI containing the RRC message implying SI reading is sent to the UE. Measurement gaps shall be deconfigured before the start of T3.

In the test UE needs to be provided at least once every 1280ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE sends scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

Table A.8.3.5.1-1: General test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRA RF channel number		1, 2	Two FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1.
Neighbour cell		Cell 2	Cell 1 is on RF channel number 2.
CP length		Normal	
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		ON	DRX related parameters are defined in Table A.8.3.5.1-3
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331.
Time offset between cells	ms	3	Asynchronous cells
T1	S	5	
T2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	S	5	

Table A.8.3.5.1-2: Cell specific test parameters for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Parameter	Unit	Cell 1				Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel		1			2		
Number							
BW _{channel}	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.1.1 (OP.1 FDD) and		FDD	FDD	FDD	FDD	FDD	FDD
in A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0			0	
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	4	4	-Infinity	7	7
Noc Note 2	dBm/15 KHz			-(98		
\hat{E}_s/N_{oc}	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP Note3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition				AW	'GN		
N. (4 00NO 1 III 1	1 4 4 1 4 1						

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

Table A.8.3.5.1-3: DRX configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in
drx-InactivityTimer	psf1	3GPP TS 36.331
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.3.5.1-4: *TimeAlignmentTimer* -Configuration for E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Field	Value	Comment
TimeAlignmentTimer	sf1280	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

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_{ac} to be fulfilled.

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

A.8.3.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

 $Test \ requirement = RRC \ Procedure \ delay + \ T_{identify \ CGI, inter} + reporting \ delay$

= 15 + [150] + 2ms from the start of T3

= [167] ms, allow [170] ms.

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

A.8.4 E-UTRAN TDD - TDD Inter-frequency Measurements

A.8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

A.8.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.4.

The test parameters are given in Table A.8.4.1.1-1 and A.8.4.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.4.1.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.0 TDD	As specified in section A.3.1.1.2
		DL Reference Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in section A.3.1.2.2
parameters			
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	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	s	10	

Table A.8.4.1.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Се	II 1	Cel	l 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		1		2		
Number						
BW _{channel}	MHz	1	0	10)	
OCNG Pattern defined						
in A.3.2.2.1 (OP.1		OP.1	TDD	OP.2	TDD	
TDD) and in A.3.2.2.2						
(OP.2)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB			0		
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					
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	4	4	-Infinity	7	
$N_{oc}^{ m Note 3}$	dBm/15 kHz	•		-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition			-	ETU70		

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

A.8.4.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells

A.8.4.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These test will partly verify the TDD-TDD inter-frequency cell search requirements when DRX is used in section 8.1.2.3.

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_{ac} 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 common test parameters are given in Tables A.8.4.2.1-1 and A.8.4.2.1-2. DRX configuration for Test1 and Test2 are given in Table A.8.4.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.4.2.1-4. In these tests, there are two cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignmend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The tests 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 A.8.4.2.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Va	alue	
PDSCH parameters		DL Reference M	easurement	As specified in section A.3.1.1.2. Note that
•		Channel R.0 TDD		UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference M	easurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TD	D	·
E-UTRA RF Channel		1	, 2	Two TDD carrier frequencies are used.
Number				·
Channel Bandwidth	MHz		10	
(BW _{channel})				
Active cell		Ce	ell 1	Cell 1 is on RF channel number 1
Neighbour cell		Ce	ell 2	Cell 2 is on RF channel number 2
Gap Pattern Id			0	As specified in 3GPP TS 36.133 section
•				8.1.2.1.
Uplink-downlink			1 As specified in 3GPP TS 36.211 sec	
configuration				4.2 Table 4.2-2
Special subframe		6 As specified in table 4.2-1 in		As specified in table 4.2-1 in TS 36.211.
configuration				The same configuration in both cells
A3-Offset	dB	,	-6	
Hysteresis	dB		0	
CP length		No	rmal	
TimeToTrigger	S		0	
Filter coefficient			0	L3 filtering is not used
PRACH configuration			4	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not	Sent	No additional delays in random access
ŭ				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.4.2.1-3
Time offset between cells		3	μs	Synchronous cells
T1	S		5	
T2	s	5	30	

Table A.8.4.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Се	II 1	Ce	ell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel		•	1	2		
Number						
BW _{channel}	MHz	1	0	1	0	
OCNG Patterns						
defined in A.3.2.1.1		OP.1	TDD	OP.2	2 TDD	
(OP.1 TDD) and in						
A.3.2.1.2 (OP.2 TDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			0		
PCFICH_RB	dB					
PHICH_RA	dB	,	_			
PHICH_RB	dB	()			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
N _{oc} Note 2	dBm/15 kHz			-98		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition				ETU70		

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

Table A.8.4.2.1-3: drx-Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rield	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.4.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

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

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

A.8.4.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

A.8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used

A.8.4.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX when L3 filtering is used. This test will partly verify the TDD-TDD inter-frequency cell search in DRX requirements in section 8.1.2.3.2.2 and the UE behaviour with the filterCoefficient defined in [2].

The test parameters are given in Tables A.8.4.3.1-1, A.8.4.3.1-2, A.8.4.3.1-3 and A.8.4.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 1 as defined in Table 8.1.2.1-1 is provided.

The uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Table A.8.4.3.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.2
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2
parameters		Channel R.6 TDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are
			used.
Channel Bandwidth (BW _{channel})	MHz	10	
Time offset between cells	μs	3	synchronous cells
Gap Pattern Id		1	As specified in 3GPP TS 36.133
			section 8.1.2.1.
Uplink-downlink configuration		1	As specified in table 4.2.2 in TS
of cells			36.211
Special subframe configuration		6	As specified in table 4.2.1 in TS
of cells			36.211
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are
			defined in Table A.8.4.3.1-3
T1	S	30	
T2	S	7	

Table A.8.4.3.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit		Cell 1	С	ell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel Number		1		2		
BW _{channel}	MHz	10		1	0	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.2.2 (OP.2 TDD)		OP.1 TDD		OP.2 TDD		
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB			0		
PHICH_RB	dB		0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA ^{Note 1}	dB					
OCNG_RB ^{Note 1}	dB					
$\mathbf{\hat{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	4	4	4	24	
$N_{oc}^{$	dBm/15 KHz	-98				
\hat{E}_s/N_{oc}	dB	4	4	4	24	
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-74	
SCH_RP Note 3	dBm/15 KHz	-94	-94	-94	-74	
Propagation Condition			AW	'GN		

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

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

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

Table A.8.4.3.1-3: DRX-Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
onDurationTimer	psf1	As specified in section 6.3.2 in 3GPP TS 36.331
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	sf1	
longDRX-CycleStartOffset	sf1280	
shortDRX	disable	

Table A.8.4.3.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD-TDD inter-frequency event triggered reporting in DRX under AWGN propagation conditions with DRX when L3 filtering is used

Field	Value	Comment
TimeAlignmentTimer	sf500	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

A.8.4.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of

time period T2 to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

A.8.5 E-UTRAN FDD - UTRAN FDD Measurements

A.8.5.1 E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions

A.8.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN FDD- UTRAN FDD cell search requirements in section 8.1.2.4.1.

The test parameters are given in Tables A.8.5.1.1-1, A.8.5.1.1-2 and A.8.5.1.1-3 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 A.8.5.1.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD) measurement quantity		CPICH Ec/Io	
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo 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	

Table A.8.5.1.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 F	DD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB		ļ		
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	_			
PHICH_RB	dB	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	4		
\hat{E}_s/N_{oc}	dB	4	4		
N_{oc}	dBm/15 kHz	-98			
RSRP	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		ETU:	70		
	auch that bath as	allo are fully allocated and a sone			

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 A.8.5.1.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Jnit Cell 2		
		T1	T2	
UTRA RF Channel Number		1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.941		
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8	
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/lo	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 lor.

Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

A.8.5.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.5.2 E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation conditions

A.8.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN FDD - UTRAN FDD cell search requirements for identification of a new UTRA FDD cell for SON given in section 8.1.2.4.7.1.

The test parameters are given in Tables A.8.5.2.1-1, A.8.5.2.1-2 and A.8.5.2.1-3 below. In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. Prior to the start of time period T1, an interRATperiodic measurement reporting configuration with purpose reportStrongestCellsForSON is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.5.2.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	·
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	>5	During T1, cell 2 shall be powered off, and
			during the off time the primary scrambling
			code shall be changed, The intention is to
			ensure that cell 2 has not been detected by
			the UE prior to the start of period T2.
T2	S	6	

Table A.8.5.2.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 I	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{ m Note~3}$	dBm/15 kHz	-98	3		
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWC	GN .		
Note 1: OCNG shall be used spectral density is ac	hieved for all OF	ells are fully allocated and a cons DM symbols. are assigned to the LIE prior to the			

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

Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.8.5.2.1-3: Cell specific test parameters for UTRAN FDD (cell # 2) for UTRAN FDD cell search for SON ANR under AWGN propagation conditions

Parameter	Unit	Cell 2			
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.941			
\hat{I}_{or}/I_{oc}	dB	-Infinity	-3.35		
I_{oc}	dBm/3.84 MHz	-70			
CPICH_Ec/Io	dB	-Infinity	-15		
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 $I_{\rm or}$.

A.8.5.2.2 Test Requirements

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

NOTE:

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.5.3 E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used under fading propagation conditions

A.8.5.3.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN FDD-UTRAN FDD cell search requirements when DRX is used in section 8.1.2.4.1.2.

In these tests, there are two cells, one E-UTRAN cell and one UTRAN cell, and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The common test parameters are given in Table A.8.5.3.1-1. Cell specific test parameters are given in Table A.8.5.3.1-2 for E-UTRAN and in Table A.8.5.3.1-5 for UTRAN. DRX configuration for Test1 and Test2 are given in Table A.8.5.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.5.2.1-4.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.5.3.1-1: General test parameters for E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-		DL Reference Measurement		As specified in section A.3.1.1.1 Note that
UTRAN FDD)		Channel R.0 FDD)	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference Me		As specified in section A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD)	
Gap Pattern Id		()	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Ce	II 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Ce	II 2	Cell 2 is on UTRA RF channel number 1.
CP length		Nor	mal	Applicable to cell 1
E-UTRA RF Channel		1		One E-UTRA FDD carrier frequency is
Number				used.
E-UTRA Channel Bandwidth	MHz	1	0	
(BW _{channel})				
UTRA RF Channel Number		1		One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH	l Ec/lo	
measurement quantity				
b1-Threshold-UTRA	dB	-1	8	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	()	
TimeToTrigger	S	()	
Filter coefficient		(L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access
				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.5.3.1-3
Monitored UTRA FDD cell		12		UTRA cells on UTRA RF channel 1
list size				provided in the cell list.
T1	S	5		
T2	S	6	30	

Table A.8.5.3.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) event triggered reporting of UTRAN FDD cell when DRX is used under fading propagation conditions

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 F	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	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	4		
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98	3		
RSRP Note 3	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
\hat{E}_s/N_{oc}	dB	4	4		
Propagation Condition		ETU	70		
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					

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

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

Table A.8.5.3.1-3: drx-Configuration to be used in E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
Field	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	

Table A.8.5.3.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN FDD-UTRAN FDD event triggered reporting when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

Table A.8.5.3.1-5: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell when DRX is used under fading propagation conditions

Parameter	Unit	Cell 2		
		T1	T2	
UTRA RF Channel Number		1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.94	1	
\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 (N	ote 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

Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

A.8.5.3.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 2400 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE sends the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 20*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A.8.5.4 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

A.8.5.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN cells. This test will partly verify the Enhanced UTRA FDD cell identification requirements in section 8.1.2.4.1.1.1a.

The test parameters are given in Tables A.8.5.4.1-1, A.8.5.4.1-2 and A.8.5.4.1-3 below. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. Prior to time duration T2, the UE shall not have any timing information of cell 2. Cell 2 is powered up at the beginning of the T2,

Table A.8.5.4.1-1: General test parameters for E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	As specified in section A.3.1.1.1.
		Channel R.0 FDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	
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 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	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	5	
T2	S	2	

Table A.8.5.4.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	10		
OCNG Pattern defined in				
A.3.2.1.1 (OP.1 FDD)		OP.1 I	FDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	0		
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA ^{Note 1}	dB			
OCNG_RB ^{Note 1}	dB			
$\hat{E}_{_{\mathrm{s}}}/I_{_{\mathrm{ot}}}$	dB	4	4	
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98	3	
\hat{E}_s/N_{oc}	dB	4	4	
RSRP Note 4	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
Propagation Condition		AWC	SN .	
spectral density is acl	hieved for all OF	ells are fully allocated and a cons DM symbols. are assigned to the UE prior to t	·	

- 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
- RSRP levels have been derived from other parameters for information purposes. They are not Note 4: settable parameters themselves.

Table A.8.5.4.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN FDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit	Cell 2		
		T1	T2	
UTRA RF Channel Number		1		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.94	1	
\hat{I}_{or}/I_{oc}	dB	- 00	0.02	
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/Io ^{Note 3}	dB	-∞	-13	
Propagation Condition		AWG	N	

The DPCH level is controlled by the power control loop. Note 1:

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}.

This gives an SCH Ec/lo of -15dB Note 3:

A.8.5.4.2 Test Requirements

The UE shall send the first measurement report containing the primary scrambling code of cell 2, with a measurement reporting delay less than [960] ms from the beginning of time period T2. The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH

A.8.6 E-UTRAN TDD - UTRAN FDD Measurements

A.8.6.1 E-UTRAN TDD - UTRAN FDD event triggered reporting under fading propagation conditions

A.8.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRAN TDD- UTRAN FDD cell search requirements in section 8.1.2.4.2.

The test parameters are given in Tables A.8.6.1.1-1, A.8.6.1.1-2 and A.8.6.1.1-3 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 A.8.6.1.1-1: 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.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
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/lo	
b1-Threshold-UTRA	dB	-18	CPICH Ec/lo 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	

Table A.8.6.1.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Unit	Cell 1		
	T1	T2	
	1		
MHz	10)	
	OP.1	TDD	
dB			
dB	_		
dB	0		
dB			
dB	4	4	
dB	4	4	
dBm/15 kHz	-98	3	
dBm/15 kHz	-94	-94	
dBm/15 kHz	-94	-94	
	ETU	70	
	MHz dB	T1 MHz OP.1 OP.	

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 A.8.6.1.1-3: 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/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.94	1	
\hat{I}_{or}/I_{oc}	dB	-Infinity	-1.8	
I_{oc}	dBm/3.84 MHz	-70		
CPICH_Ec/lo	dB	-Infinity	-14	
Propagation Condition		Case 5 (N	lote 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.

A.8.6.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.7 E-UTRAN TDD – UTRAN TDD Measurements

A.8.7.1 E-UTRAN TDD to UTRAN TDD cell search under fading propagation conditions

A.8.7.1.1 Test Purpose and Environment

A.8.7.1.1.1 3.84 Mcps TDD option

A.8.7.1.1.2 1.28 Mcps TDD option

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the E-UTRA TDD to UTRA TDD cell search requirements in section 8.1.2.4.3 under fading propagation conditions.

This test scenario comprised of 1 E-UTRA TDD serving cell, and 1 UTRA TDD cell to be searched. Test parameters are given in Table A.8.7.1.1.2-1, A.8.7.1.1.2-2, and A.8.7.1.1.2-3. Gap pattern configuration #0 as defined in table 8.1.2.1-1 is provided.

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 A.8.7.1.1.2-1: 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	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	S	5	_
T2	S	10	

Table A.8.7.1.1.2-2: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit	Ce	II 1	
		T1	T2	
E-UTRA RF Channel		1		
Number				
BW _{channel}	MHz	1	0	
OCNG Pattern defined in		OP 1	TDD	
A.3.2.2.1 (OP.1 TDD)		01.1	טטו	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RB	dB			
SSS_RB	dB			
PCFICH_PA	dB			
PHICH_PA	dB			
PHICH_PB	dB	0	0	
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		ET	U70	

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 A.8.7.1.1.2-3: Cell specific test parameters for cell search E-UTRA TDD to UTRA TDD test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		()	Dwl	PTS
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/lor	dB	-3	-3		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{NO1E2}	dB	-3	-3		
\hat{I}_{or}/I_{oc}	dB	-inf	5	-inf	5
I_{oc}	dBm/1.28 MHz		-8	30	
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 $I_{\rm or}$.

Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102

A.8.7.1.1.3 7.68 Mcps TDD option

A.8.7.1.2 Test Requirements

A.8.7.1.2.1 3.84 Mcps TDD option

A.8.7.1.2.2 1.28 Mcps TDD option

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 6400 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.7.1.2.3 7.68 Mcps TDD option

A.8.7.2 E-UTRAN TDD-UTRAN TDD cell search when DRX is used under fading propagation conditions

A.8.7.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD to UTRAN TDD inter-RAT cell search requirements when DRX is used in section 8.1.2.4.3.2 under fading propagation conditions.

The common test parameters are given in Tables A.8.7.2.1-1, A.8.7.2.1-2 and A.8.7.2.1-3. DRX configuration for Test1 and Test2 are given in Table A.8.7.2.1-4 and time alignment timer and scheduling request related parameters in Table

A.8.7.2.1-5. In these tests, there are two cells, 1 E-UTRAN TDD serving cell and 1 UTRAN TDD cell to be searched, Gap pattern configuration # 0 as defined in table 8.1.2.1-1 is provided.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignmend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.7.2.1-1: General test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters		DL Reference Me	easurement	As specified in section A.3.1.1.2. Note that
		Channel R.0 TDE)	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference Me	easurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TDE)	
Active cell		Cell 1		E-UTRAN TDD cell
Neighbour cell		Cell 2		UTRAN 1.28Mcps TDD cell
Gap Pattern Id		0		As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe		6		As specified in table 4.2-1 in TS 36.211.
configuration				The same configuration in both cells
PRACH configuration		53		As specified in table 5.7.1-3 in 3GPP TS 36.211
CP length of cell 1		Normal		
Ofn	dB	0		
Thresh	dBm	-83		Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0		
TimeToTrigger	S	0		
Filter coefficient		0		L3 filtering is not used
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table A.8.4.2.1-3
Time offset between cells		3 ms		Asynchronous cells
T1	S	5		
T2	S	8	30	

Table A.8.7.2.1-2: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions(cell 1)

Parameter	Unit	Ce	II 1
		T1	T2
E-UTRA RF Channel			1
Number			
BWchannel	MHz	1	0
OCNG Patterns defined		OP.1	TDD
in A.3.2.1.1 (OP.1 TDD)			
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RB	dB		
SSS_RB	dB		
PCFICH_PA	dB		
PHICH_PA	dB		
PHICH_PB	dB	0	0
PDCCH_PA	dB		
PDCCH_PB	dB		
PDSCH_PA	dB		
PDSCH_PB	dB		
OCNG_RANote1	dB		
OCNG_RBNote1	dB		
\hat{E}_s/I_{ot}	dB	4	4
N _{oc} Note 2	dBm/15kHz	-98	
RSRP	dBm/15kHz	-94	-94
SCH_RP Note 3	dBm/15kHz	-94	-94
Propagation Condition		ET	U70
Note 1: OCNG shall be	used such that cel	ll is fully alloca	ted and a

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

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

for N_{oc} to be fulfilled.

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

Table A.8.7.2.1-3: Cell specific test parameters for E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions(cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		(0 DwPTS		PTS
		T1	T2	T1	T2
UTRA RF Channel Number NOTE1		Channel 2			
PCCPCH_Ec/lor	dB	-3	-3		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor ^{NOTE2}	dB	-3	-3		
\hat{I}_{or}/I_{oc}	dB	-inf	9	-inf	9
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-74	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 lor.

Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP

TS 25.102

Table A.8.7.2.1-4: drx-Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1	Test2	Comment
Field	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.8.7.2.1-5: TimeAlignmentTimer and sr-ConfigIndex -Configuration to be used in E-UTRAN TDD to UTRAN 1.28Mcps TDD cell search when DRX is used in fading propagation conditions

Field	Test1 Value	Test2 Value	Comment
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

A.8.7.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 6400ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 25.6s from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A.8.7.3 E-UTRAN TDD - UTRAN TDD SON ANR cell search reporting in AWGN propagation conditions

A.8.7.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of the strongest UTRAN TDD cell for SON automatic neighbour relations. This test will partly verify the E-UTRAN TDD - UTRAN TDD cell search requirements for identification of a new UTRA TDD cell for SON given in section 8.1.2.4.13.

In the measurement control information it is indicated to the UE that periodical reporting with the purpose 'reportStrongestCellsForSON' is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. Prior to the start of time period T1, an interRAT periodic measurement reporting configuration with purpose reportStrongestCellsForSON is configured, and linked to a UTRA measurement object corresponding to channel UARFCN 1. During time duration T1, the UE shall not have any timing information of cell 2.

A.8.7.3.2 Test Parameters

The test parameters are given in Tables A.8.7.3.1-1, A.8.7.3.1-2 and A.8.7.3.1-3.

Table A.8.7.3.1-1: General test parameters for E-UTRAN TDD-UTRAN TDD cell search reporting for SON ANR in AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	>5	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	S	14	

Table A.8.7.3.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

	Parameter	Unit	Се	II 1		
			T1	T2		
E-UTRA R	RF Channel Number		1			
BW _{channel}		MHz	1	0		
OCNG Pa	tterns defined in		OP.1	TDD		
A.3.2.2.1 ((OP.1 TDD)		01.1	טטו		
PBCH_RA	1	dB				
PBCH_RE	3	dB				
PSS_RA		dB				
SSS_RA		dB				
PCFICH_I	RB	dB				
PHICH_R	A	dB				
PHICH_R	В	dB	()		
PDCCH_F	RA	dB				
PDCCH_F		dB				
PDSCH_F	RA	dB				
PDSCH_F		dB				
OCNG_R/	A ^{Note 1}	dB				
OCNG_RI	B ^{ivote 1}	dB				
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	4	4		
N_{oc} Note 3		dBm/15 kHz	-9	8		
\hat{E}_s/N_{oc}		dB	4	4		
RSRP Note	4	dBm/15 kHz	-94	-94		
SCH_RP		dBm/15 kHz	-94	-94		
Propagation	on Condition		AW	GN		
Note 1:		d such that both cells are fully allocated and a constant ver spectral density is achieved for all OFDM symbols.				
Note 2:	The resources for upl of time period T2.					
Note 3:	Interference from other	her cells and noise sources not specified in the test is stant over subcarriers and time and shall be modelled as				
	AWGN of appropriate	e power for N_{oc} to be fulfilled.				
Note 4:	RSRP levels have be	been derived from other parameters for information				

Table A.8.7.3.1-3: Cell specific test parameters for UTRAN TDD (cell # 2) for UTRAN TDD cell search for SON ANR under AWGN propagation conditions

purposes. They are not settable parameters themselves.

Parameter	Unit	Cell 2			
		Т	T1		Γ2
UTRA RF Channel number Note2			Char	nel 2	
DL timeslot number		0	DwPTS	0	DwPTS
PCCPCH_Ec/lor	dB	-3		-3	
DwPCH_Ec/lor	dB		0		0
OCNS_Ec/lor	dB	-3		-3	
Îor/loc	dB	-Infinity 5		5	
PCCPCH RSCP Note1	dBm	-Infinity	n.a.	-73	n.a.
lo Note1	dBm/1.28MHz	-Infinity -70.88		0.88	
loc	dBm/1.28MHz	-75			
Propagation condition		AWGN			

Note 1: PCCPCH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

A.8.7.3.3 Test Requirements

The UE shall send the first measurement report containing the physical cell identity of cell 2, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

The rate of correct measurement reports observed with this delay during repeated tests shall be at least 90%.

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.8 E-UTRAN FDD – GSM Measurements

A.8.8.1 E-UTRAN FDD – GSM event triggered reporting in AWGN

A.8.8.1.1 Test Purpose and Environment

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 FDD - GSM cell search requirements in section 8.1.2.4.5.

The test parameters are given in Tables A.8.8.1.1-1, A.8.8.1.1-2 and A.8.8.1.1-3 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 A.8.8.1.1-1: 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.3.1.1.1.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1.
(E-UTRAN FDD)		Channel R.6 FDD	
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	MHz	10	
(BW _{channel})			
Inter-RAT (GSM) measurement		GSM Carrier RSSI	
quantity			
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	

Table A.8.8.1.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of GSM cell in AWGN

Unit	Cell 1			
	T1	T2		
	1			
MHz	10			
	OP.1 F	DD		
dB				
dB	0			
dB				
dB	4	4		
dB	4	4		
dBm/15 kHz	-98			
dBm/15 kHz	-94	-94		
dBm/15 kHz	-94 -94			
	AWG	SN		
	MHz dB	T1 MHz 10 OP.1 F dB dB dB dB dB dB dB dB dB d		

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 A.8.8.1.1-3: 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	
GSM BSIC		N/A	Valid	

A.8.8.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report including 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 = $2*T_{Measurement\ Period,\ GSM}$ = 2*480ms = 960ms.

Initial BSIC identification delay = 2160 ms.

A.8.8.2 E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

A.8.8.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN FDD-GSM cell search requirements when DRX is used in section 8.1.2.4.5.2.

In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The common test parameters are given in Table A.8.8.2.1-1. Cell specific test parameters are given in Table A.8.8.2.1-2 for E-UTRAN and in Table A.8.8.2.1-5 for GSM. DRX configuration for Test1 and Test2 are given in Table A.8.8.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.8.2.1-4.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.8.2.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-		DL Reference Measurement		As specified in section A.3.1.1.1.
UTRAN FDD)		Channel R.0 FDD)	·
PCFICH/PDCCH/PHICH		DL Reference Me	asurement	As specified in section A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD)	·
Gap Pattern Id		()	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Ce	II 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Ce	II 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Nor	mal	Applicable to cell 1
E-UTRA RF Channel		,		One E-UTRA FDD carrier frequency is
Number				used.
E-UTRA Channel Bandwidth	MHz	10		
(BW _{channel})				
Inter-RAT (GSM)		GSM Carrier RSSI		
measurement quantity				
B1-Threshold-GERAN	dBm	3-	30	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	()	
TimeToTrigger	S	()	
Filter coefficient		()	L3 filtering is not used
PRACH configuration		4	1	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not	Sent	No additional delays in random access
				procedure.
DRX		ON		DRX related parameters are defined in Table A.8.8.2.1-3
Monitored GSM cell list size		6 GSM neighbours including		List of GSM cells provided before T2
		ARFCN 1		starts.
T1	S	5		
T2	S	5	45	

Table A.8.8.2.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW _{channel}	MHz	10			
OCNG Pattern defined in					
A.3.2.1.1 (OP.1 FDD)		OP.1 F	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB	0			
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				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-98	3		
RSRP Note 3	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
\hat{E}_s/N_{oc}	dB	4	4		
Propagation Condition		AWG			
Note 1: OCNG shall be used spectral density is ac		ells are fully allocated and a cons	stant total transmitted power		

spectral density is achieved for all OFDM symbols.

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

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

Table A.8.8.2.1-3: drx-Configuration to be used in E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment			
rieid	Value	Value				
onDurationTimer	psf1	psf1				
drx-InactivityTimer	psf1	psf1				
drx-RetransmissionTimer	psf1	psf1				
longDRX-CycleStartOffset	sf40	sf1280				
shortDRX	Disable	Disable				
Note: For further information see section 6.3.2 in 3GPP TS 36.331.						

Table A.8.8.2.1-4: TimeAlignmentTimer and sr-ConfigIndex -Configuration to be used in E-UTRAN FDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
rieid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section 10.1 in 3GPP TS 36.213.

Table A.8.8.2.1-5: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.8.8.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report including BSIC of cell #2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 42.8 seconds from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A.8.8.3 E-UTRAN FDD – GSM event triggered reporting in AWGN with enhanced BSIC identification

A.8.8.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements with enhanced BSIC identification. This test will partly verify the E-UTRAN FDD - GSM cell search requirements in section 8.1.2.4.5.1.2a

The test parameters are given in Tables A.8.8.3.1-1, A.8.8.1.1-2 and A.8.8.3.1-3 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. Prior time duration T1, the UE shall not have any timing information of cell 2. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a GSM measurement object including channel ARFCN 1. Cell 2 is powered up at the beginning of T2.

Table A.8.8.3.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN with enhanced BSIC identification

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour 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	MHz	10	
(BW _{channel})			
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	T1 ends at the end of the last TTI where the measurement configuration is given
T2	s	2	

Table A.8.8.3.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of GSM cell in AWGN with enhanced BSIC identification

	T1			
	1.1	T2		
	1			
MHz	10			
	OP.1 F	DD		
dB				
dB	0			
dB				
dB	4	4		
dB	4	4		
dBm/15 kHz	-98			
dBm/15 kHz	-94	-94		
dBm/15 kHz	-94	-94		
	AWG	N		
	dB d	MHz 10 OP.1 F dB dB dB dB dB dB dB dB dB d		

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 A.8.8.3.1-3: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell in AWGN with enhanced BSIC identification

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number		AF	RFCN 1
RXLEV	dBm	-∞	-75
GSM BSIC		N/A	Valid

A.8.8.3.2 Test Requirements

The UE shall send one Event B1 triggered measurement report including BSIC of cell # 2, with a measurement reporting delay less than [2280] 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 2280 ms, which is the sum of the event triggered measurement reporting delay and the enhanced initial BSIC identification delay.

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

Initial BSIC identification delay = 1320 ms.

A.8.9 E-UTRAN FDD - UTRAN TDD measurements

A.8.9.1 E-UTRAN FDD - UTRAN TDD event triggered reporting in fading propagation conditions

A.8.9.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. The test will partly verify the E-UTRAN FDD - UTRAN TDD cell search requirements in section 8.1.2.4.4 in fading environment.

The test parameters are given in Table A.8.9.1.1-1, A.8.9.1.1-2 and A.8.9.1.1-3 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 A.8.9.1.1-1: 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. Measurement Gap Repetition Period = 80ms
Inter-RAT measurement quantity		UTRA TDD PCCPCH RSCP	
Threshold other system	dBm	-71	UTRA TDD PCCPCH RSCP threshold for event B1.
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX			OFF
T1	S	5	
T2	S	15	

Table A.8.9.1.1-2: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell1)

Parameter	Unit Cell 1		l 1		
		T1	T2		
E-UTRA RF Channel		1			
Number					
BW _{channel}	MHz	10)		
OCNG Patterns defined		OP.1	FDD		
in A.3.2.1.1 (OP.1 FDD)					
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
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/15KH	-9	8		
1 voc	z				
RSRP	dBm	-94	-94		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	4	4		
P-SCH_RP	dBm	-9	4		
S-SCH_RP	dBm	-9	4		
Propagation Condition		ETU70			
Note 1: OCNG shall be used such that sell 1 is fully allocated and a					

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.8.9.1.1-3: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell2)

Parameter	Unit	Cell 2				
		T1		T1 1		
Timeslot Number		0	DwPTS	0	DwPTS	
UTRA RF Channel			Cha	nnel1		
Number (NOTE1)						
PCCPCH_Ec/lor	dB	-Inf	inity	-3		
DwPCH_Ec/lor	dB	-Inf	inity		0	
OCNS_Ec/lor		-Infinity		-3		
\hat{I}_{or}/I_{oc}	dB	-Infinity		9		
I_{oc}	dBm/	-70				
00	1.28					
	MHz					
PCCPCH_RSCP	dB	-Infinity		-64		
Propagation		Case 3 (NOTE2)				
Condition						
NOTE1: The DPCH of the cell is located in a timeslot other than 0.						

A.8.9.1.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 12800 ms from the beginning of time period T2.

NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to [2] $x\ TTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.10 E-UTRAN TDD – GSM Measurements

A.8.10.1 E-UTRAN TDD – GSM event triggered reporting in AWGN

A.8.10.1.1 Test Purpose and Environment

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 section 8.1.2.4.6.

The test parameters are given in Tables A.8.10.1.1-1, A.8.8.1.1-2 and A.8.10.1.1-3 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 A.8.10.1.1-1: 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.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
Special subframe configuration		6	As specified in table 4.2-1 in 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	

Table A.8.10.1.1-2: 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					
A.3.2.2.1 (OP.1 TDD)		OP.1 7	ΓDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4		
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98	3		
\hat{E}_s/N_{oc}	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWG	SN .		
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					

- 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 A.8.10.1.1-3: 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	
GSM BSIC		N/A	Valid	
Propagation Condition		А	WGN	

A.8.10.1.2 Test Requirements

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 = $2*T_{Measurement\ Period,\ GSM} = 2*480ms = 960ms$.

Initial BSIC identification delay = 2160 ms.

A.8.10.2 E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

A.8.10.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These tests will partly verify the E-UTRAN TDD-GSM cell search requirements when DRX is used in section 8.1.2.4.6.

In these tests, there are two cells, one E-UTRAN cell and one GSM cell, and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

The common test parameters are given in Table A.8.10.2.1-1. Cell specific test parameters are given in Table A.8.10.2.1-2 for E-UTRAN and in Table A.8.10.2.1-5 for GSM. DRX configuration for Test1 and Test2 are given in Table A.8.10.2.1-3 and time alignment timer and scheduling request related parameters in Table A.8.10.2.1-4.

In Test 1 UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignment is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event B1 is used. The tests consist of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

Table A.8.10.2.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Parameter	Unit	Test 1	Test 2	Comment	
		Value			
PDSCH parameters (E-		DL Reference Measurement		As specified in section A.3.1.1.2. Note that	
UTRAN TDD)		Channel R.0 TDD		UE may only be allocated at On Duration	
PCFICH/PDCCH/PHICH		DL Reference Me		As specified in section A.3.1.2.2.	
parameters (E-UTRAN TDD)		Channel R.6 TDD)		
Gap Pattern Id		()	As specified in 3GPP TS 36.133 section	
				8.1.2.1.	
Active cell		Ce	II 1	Cell 1 is on E-UTRA RF channel number	
				1.	
Neighbour cell		Ce	II 2	Cell 2 is on Absolute RF Channel Number	
				1 (GSM cell)	
Special subframe		(6	As specified in table 4.2-1 in TS 36.211.	
configuration					
Uplink-downlink		′		As specified in 3GPP TS 36.211 section	
configuration				4.2 Table 4.2-2	
CP length		Nor	mal	Applicable to cell 1	
E-UTRA RF Channel		·	1	One E-UTRA TDD carrier frequency is	
Number				used.	
E-UTRA Channel Bandwidth	MHz	1	0		
(BW _{channel})					
Inter-RAT (GSM)		GSM Car	rier RSSI		
measurement quantity					
B1-Threshold-GERAN	dBm	-80		GSM Carrier RSSI threshold for event B1.	
Hysteresis	dB	()		
TimeToTrigger	S	()		
Filter coefficient		()	L3 filtering is not used	
PRACH configuration		4	1	As specified in table 5.7.1-2 in TS 36.211	
Access Barring Information	-	Not Sent		No additional delays in random access	
				procedure.	
DRX		ON		DRX related parameters are defined in	
				Table A.8.10.2.1-3	
Monitored GSM cell list size		6 GSM neighbours including		List of GSM cells provided before T2	
		ARFCN 1		starts.	
T1	S	5			
T2	S	5 45			

Table A.8.10.2.1-2: Cell specific test parameters for E-UTRAN TDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel Number		1		
BW _{channel}	MHz	10		
OCNG Patterns defined in				
A.3.2.2.1 (OP.1 TDD)		OP.1 T	TDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	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	4	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98		
RSRP Note 3	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
\hat{E}_s/N_{oc}	dB	4	4	
Propagation Condition		AWG	SN	
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				

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

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

Table A.8.10.2.1-3: drx-Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
rieiu	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	
Note: For further information see section	6.3.2 in 3GF	P TS 36.331	

Table A.8.10.2.1-4: *TimeAlignmentTimer* and *sr-ConfigIndex* -Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1	Test2	Comment
Fleid	Value	Value	
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section 10.1 in 3GPP TS 36.213.

Table A.8.10.2.1-5: Cell specific test parameters for GSM (cell # 2) for event triggered reporting of GSM cell when DRX is used in AWGN

Parameter	Unit	(Cell 2
		T1	T2
Absolute RF Channel Number		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.8.10.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report including BSIC of cell #2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 42.8 seconds from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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 one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

A. 8.11 Monitoring of Multiple Layers

A. 8.11.1Multiple E-UTRAN FDD-FDD Inter-frequency event triggered reporting under fading propagation conditions

A. 8.11.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of multiple events. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.

The test parameters are given in Tables A.8.11.1.1.1-1 and A.8.11.1.1.1-2. In this test, there are three cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 or cell 3.

Table A. 8.11.1.1-1: General test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRA RF Channel Number		1, 2, 3	Three FDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2 and cell 3	Cell 2 is on RF channel number 2 and cell 3 is on RF channel number 3
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E- UTRAN FDD cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	10	

Table A. 8.11.1.1-2: Cell specific test parameters for Inter-frequency E-UTRA FDD – E-UTRA FDD and E-UTRA FDD cell search under fading

Parameter	Unit	Cell 1		Cel	Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel Number			1	2		3	3	
BW _{channel}	MHz		10	10)	10		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.	1 FDD	OP.2 FDD		OP.2 FI	DD .	
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB			0		0		
PCFICH_RB	dB							
PHICH_RA	dB		0					
PHICH_RB	dB		-					
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA ^{Note 1}	dB							
OCNG_RB ^{Note}	dB							
$N_{oc}^{ m Note 3}$	dBm/15 kHz				-98			
RSRP Note 4	dBm/15 kHz	-98	-98	-Infinity	-95	-Infinity	-95	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	0	-Infinity	3	-Infinity	3	
SCH_RP Note 4	dBm/15 kHz	-98	-98	-Infinity	-95	-Infinity	-95	
\hat{E}_s/N_{oc}	dB	0	0	-Infinity	3	-Infinity	3	
Propagation Condition			VGN	ETU70		ETU70		

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{ac} 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.

A. 8.11.1.2 Test Requirements

The UE shall send Event A3 triggered measurement reports for both cell 2 and cell 3, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.2 E-UTRAN TDD – E-UTRAN TDD and E-UTRAN TDD Interfrequency event triggered reporting under fading propagation conditions

A.8.11.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of two events. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.

The test parameters are given in Tables A.8.11.2.1-1 and A.8.11.2.1-2. In this test, there are three cells on different carrier frequencies and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.2.1-1: General test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
E-UTRA RF Channel Number		1, 2, 3	Three TDD carrier frequencies are used.
Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbor cells		Cell 2 and Cell 3	Cell 2 and 3 are on RF channel numbers 2 and 3 respectively
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	10	

Table A.8.11.2.1-2: Cell specific test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions cells

Parameter	Unit	C	ell 1	Cell 2		Cell 3		
		T1	T2	T1	T2	T1	T2	
E-UTRA RF Channel			1	2		3		
Number					•	3		
BW _{channel}	MHz	,	10	10)	1()	
OCNG Patterns defined								
in A.3.2.2.1 (OP.1 TDD)		OP.	1 TDD	OP.2	TDD	OP.2	TDD	
and in A.3.2.2.2 (OP.2 TDD)								
100)								
PBCH_RA	dB							
PBCH_RB	dB							
PSS_RA	dB							
SSS_RA	dB			0		0		
PCFICH_RB	dB							
PHICH_RA	dB		0					
PHICH_RB	dB		0					
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			-6	98			
RSRP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95	
\hat{E}_{s}/I_{ot}	dB	0	0	-inf	3	-inf	3	
SCH_RP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95	
\hat{E}_s/N_{oc}	dB	0	0	-inf	3	-inf	3	
Propagation Condition		AV	VGN	ETU70		ETU70		
Note 1: OCNG shall be	used such that al		ully allocated	and a const	ant total tra	ansmitted pov	/er	

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

Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

A.8.11.2.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2 with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event A3 triggered measurement report for cell 3 with a measurement reporting delay less than 7680 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.

A.8.11.3 E-UTRAN FDD-FDD Inter-frequency and UTRAN FDD event triggered reporting under fading propagation conditions

A.8.11.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter frequency and UTRAN FDD measurements. This test will partly verify the FDD-FDD inter-frequency cell search requirements in section 8.1.2.3 and the E-UTRAN FDD- UTRAN FDD cell search requirements in section 8.1.2.4.1.

The test parameters are given in Tables A.8.11.3.1-1, A.8.11.3.1-2 and A.8.11.3.1-3. In this test, there are two cells on different carrier frequencies and one cell on UTRAN carrier frequency and gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.3.1-1: General test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1, 2	Two FDD carrier frequencies are used.
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
E-UTRAN FDD measurement		RSRP	
quantity			
Inter-RAT (UTRA FDD)		CPICH Ec/N0	
measurement quantity			
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dB	-88	RSRP threshold for event B2.
b2-Threshold-UTRA	dB	-18	CPICH Ec/N0 threshold for event B2.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	8	

Table A.8.11.3.1-2: Cell specific test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

Parameter	Unit	Ce	ell 1	Ce	ell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		2	
Number						
BW _{channel}	MHz	•	10	1	10	
OCNG Patterns						
defined in A.3.2.1.1		OP.	I FDD	OP.2	2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB			0		
PCFICH_RB	dB					
PHICH_RA	dB		0			
PHICH_RB	dB		0			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RANote 1	dB					
OCNG_RB ^{Note 1}	dB					
N_{oc} Note 3	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_{s}/I_{ot}	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4 4 -Infinity		7		
Propagation Condition		AV	/GN	ET	U70	

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 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

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.

Table A.8.11.3.1-3: Cell specific test parameters for UTRAN FDD (cell # 3) for event triggered reporting of UTRAN FDD cell under fading propagation conditions

Parameter	Unit	Cell	3
		T1	T2
UTRA RF Channel Number		1	
CPICH_Ec/lor	dB	-10	
PCCPCH_Ec/lor	dB	-12	
SCH_Ec/lor	dB	-12	
PICH_Ec/lor	dB	-15	
DPCH_Ec/lor	dB	N/A	
OCNS		-0.94	1
\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 (N	ote 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

Note 3: Case 5 propagation conditions are defined in Annex A of 3GPP TS 25.101.

A.8.11.3.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 4800 ms from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE:

The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.4 InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search test case

A.8.11.4.1 Test Purpose and Environment

This test is to verify that the UE makes correct reporting of an event when doing inter frequency measurements and UTRA TDD measurements. The test will partly verify the requirements in section 8.1.2.3.2 combined 8.1.2.4.3 under fading propagation conditions.

This test scenario comprised of 2 E-UTRA TDD cells operating on different frequency, and 1 UTRA TDD cell. Test parameters are given in table A.8.11.4.1-1, A.8.11.4.1-2, and A.8.11.4.1-3. Gap pattern configuration #0 as defined in section 8.1.2.1 is provided.

The test consists of 2 successive time periods, with time duration T1 and T2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 and B2 shall be used.

Table A.8.11.4.1-1: General test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cells search under fading propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference	As specified in section A.3.1.1.2
		Measurement	
POFICI I/PROCUL/PLUCIA		Channel R.0 TDD	A
PCFICH/PDCCH/PHICH		DL Reference	As specified in section A.3.1.2.2
parameters		Measurement Channel R.6 TDD	
Active cell		Cell 1	E-UTRA TDD cell is on RF channel number 1
Neighbour cell		Cell 2	E-UTRA TDD cell is on RF channel number 2
		Cell 3	1.28Mcps TDD cell
CP length of cell1 and cell2		Normal	
Uplink-downlink configuration of cell1 and cell2		1	As specified in Table 4.2-2 in TS 36.211. The same configuration in both cells
Special subframe		6	As specified in table 4.2-1 in TS 36.211. The
configuration of cell1 and			same configuration in both cells
cell2			
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
E-UTRAN TDD		RSRP	
measurement quantity			
UTRAN TDD measurement		RSCP	
quantity			
DRX		OFF	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hysteresis	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	Parameter for A3 event
Thresh1	dBm	-88	Absolute E-UTRAN RSRP threshold for event B2
Thresh2	dBm	-83	Absolute UTRAN RSCP threshold for event B2
TimeToTrigger	S	0	
Filter coefficient	_	0	L3 filtering is not used
T1	S	>5	During T1, cell 2 and cell 3 shall be powered
			off. During the off time the physical layer cell
			identity of cell 2 shall be changed, and the
			primary scrambling code of cell 3 shall be
			changed.
T2	S	15	

Table A.8.11.4.1-2: Cell specific test parameters for combined E-UTRAN TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell1 and cell2)

Parameter	Unit	Cell 1		Ce	II 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2	2		
Number							
BWchannel	MHz	1	0	10			
OCNG Pattern defined							
in A.3.2.2.1 (OP.1		OP.1	TDD	OP.2	TDD		
TDD) and in A.3.2.2.2							
(OP.2)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		•	0			
PHICH_RB	dB	(0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RANote 1	dB						
OCNG_RBNote 1	dB						
\hat{E}_s/I_{ot}	dB	4	4	-Infinity	7		
\hat{E}_s/N_{oc}	dB	4 4		-Infinity	7		
N_{oc}	dBm/15 kHz	-98					
RSRP	dBm/15 kHz	-94 -94 -Int		-Infinity	-91		
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-91		
Propagation Condition		AWGN ETU70			J70		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total							

transmitted power spectral density is achieved for all OFDM symbols.

Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.

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

Table A.8.11.4.1-3: Cell specific test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cell search under fading propagation conditions(cell3)

Parameter	Unit	Cell 3 (UTRA)			
Timeslot Number		0		DwF	PTS
		T1	T2	T1	T2
UTRA RF Channel			Char	inel 3	
Number*					
PCCPCH_Ec/lor	dB	-;	3		
DwPCH_Ec/lor	dB	0)	
OCNS_Ec/lor	dB	-3			
\hat{I}_{or}/I_{oc}	dB	-Infinity	9	-Infinity	9
I_{oc}	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-Infinity -74 n.a.			a.
Propagation Condition		Case 3			
Note1: The DPCH of all cells are located in a timeslot other than 0.					

Note2: In the case of multi-frequency network, the UTRA RF Channel Number

can be set for the primary frequency in this test.

P-CCPCH RSCP levels have been derived from other parameters for Note3: information purposes. They are not settable parameters themselves.

A.8.11.4.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report, with a measurement reporting delay less than 12.8s from the beginning of time period T2.

The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

NOTE: The actual overall delays measured in the test may be up to $2xTTI_{DCCH}$ higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

A.8.11.5 Combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

A.8.11.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements. This test will partly verify the E-UTRAN FDD-FDD inter-frequency cell search requirements in section 8.1.2.3.1 and simultaneously the E-UTRAN FDD- GSM cell search requirements in section 8.1.2.4.5.

The test parameters are given in Tables A.8.11.5.1-1, A.8.11.5.1-2 and A.8.11.5.1-3. In this test, there are two cells on different carrier frequencies and one GSM cell. Gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.5.1-1: General test parameters for combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-		DL Reference Measurement	As specified in section A.3.1.1.1.
UTRAN FDD)		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1.
parameters		Channel R.6 FDD	
(E-UTRAN FDD)			
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth (BW _{channel})	MHz	10	
E-UTRAN FDD measurement quantity		RSRP	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hysteresis	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E- UTRAN FDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dBm	-85	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E-UTRA serving cell RSCP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	S	5	
T2	S	10	

Table A.8.11.5.1-2: Cell specific test parameters for E-UTRAN FDD cells for combined E-UTRAN FDD

– E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 1 T1 T2		Ce	II 2	
				T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW _{channel}	MHz	•	10	1	0	
OCNG Patterns						
defined in A.3.2.1.1		OP.	1 FDD	OP.2	FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
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					
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7	
Propagation Condition		ET	U70	ET	J70	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is						

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

Table A.8.11.5.1-3: Cell specific test parameters for GSM (cell # 3) for combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 2	
		T1	T2
Absolute RF Channel Number	RF Channel Number ARFCN3		RFCN3
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.8.11.5.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than [7200] 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 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_{ac} 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.

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 [7200] ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM} = 2*N_{freq}*480ms = 1920ms$.

Initial BSIC identification delay = [5280] ms, when one carrier frequency other than GSM is monitored in the gaps.

A.8.11.6 Combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

A.8.11.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of multiple events when doing inter frequency and GSM measurements. This test will partly verify the E-UTRAN TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.2 and simultaneously the E-UTRAN TDD- GSM cell search requirements in section 8.1.2.4.6.

The test parameters are given in Tables A.8.11.6.1-1, A.8.11.6.1-2 and A.8.11.6.1-3. In this test, there are two cells on different carrier frequencies and one GSM cell. Gap pattern configuration # 0 as defined in Table 8.1.2.1-1 is provided.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and B2 is used. The test consists of two successive time periods, with time duration of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2 and cell 3.

Table A.8.11.6.1-1: General test parameters for combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-		DL Reference Measurement	As specified in section A.3.1.1.2.
UTRAN TDD)		Channel R.0 TDD	7.6 aposition 17.6.1.1.2.
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TDD	As specified in section A.S. 1.2.2.
(E-UTRAN TDD)		Charmer N.0 TDD	
	-	6	As an acifical in table 4.2.4 in TC 2C 244. The
Special subframe		6	As specified in table 4.2-1 in TS 36.211. The
configuration of cell1 and			same configuration in both cells
cell2			10.11.000000000000000000000000000000000
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2
of cell1 and cell2			Table 4.2-2
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2.
			Cell 3 is on Absolute RF Channel Number 3
			(GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth	MHz	10	
(BW _{channel})			
E-UTRAN TDD measurement		RSRP	
quantity		KOKI	
Ofn	dB	0	Parameter for A3 and B2 event
Olli	ub	0	Farameter for A5 and b2 event
	ID	0	D
Ocn	dB	0	Parameter for A3 event
	175		D 0 10 100
Hysteresis	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	
TimeToTrigger	S	0	
			1000
Filter coefficient		0	L3 filtering is not used
DDV		055	055
DRX		OFF	OFF
T: "		1	<u> </u>
Time offset between E-	ms	3 ms	Asynchronous cells
UTRAN TDD cells			
Inter-RAT (GSM)		GSM Carrier RSSI	
		GSW Carrier KSSI	
measurement quantity	dDm	05	DCDD throughold for event DQ. This is the
b2-Threshold-E-UTRA	dBm	-85	RSRP threshold for event B2. This is the
			threshold for E-UTRA in the B2 configuration. E-
			UTRA serving cell RSCP is below this
			throughout the test to account for measurement
1071	<u> </u>	1	accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including	List of GSM cells provided before T2 starts.
		ARFCN 3	
T1	S	5	
T2	S	10	

Table A.8.11.6.1-2: Cell specific test parameters for E-UTRAN TDD cells for combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 1 T1 T2		Ce	II 2		
				T1	T2		
E-UTRA RF Channel		1		2	2		
Number							
BW _{channel}	MHz	,	10	1	0		
OCNG Patterns							
defined in A.3.2.2.1		OP.	I TDD	OP.2	TDD		
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB			0			
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		_				
PHICH_RB	dB		0				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA ^{Note 1}	dB						
OCNG_RB ^{Note 1}	dB						
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
\hat{E}_s/N_{oc}	dB	4	4	-Infinity	7		
Propagation Condition		ET	U70	ETI	J70		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is							

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

Table A.8.11.6.1-3: Cell specific test parameters for GSM (cell # 3) for combined E-UTRAN TDD – E-UTRA TDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Cell 3	
		T1	T2
Absolute RF Channel Number		ARFCN3	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

A.8.11.6.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than [7200] 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 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_{ac} 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.

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 [7200] ms, which is the sum

of the event triggered measurement reporting delay and the initial BSIC identification delay.

The event triggered measurement reporting delay = $2*T_{Measurement\ Period,\ GSM} = 2*N_{freq}*480ms = 1920ms$.

Initial BSIC identification delay = [5280] ms, when one carrier frequency other than GSM is monitored in the gaps.

A.8.12 RSTD Intra-frequency Measurements

A.8.12.1 E-UTRAN FDD intra-frequency RSTD measurement reporting delay test case

A.8.12.1.1 Test Purpose and Environment

The purpose of the test is to verify that the RSTD measurement reporting delay meets the requirements specified in Section 8.1.2.5.1 in an environment with fading propagation conditions.

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the serving cell. Cell 2 and Cell 3 are the neighbour cells. All cells are on the same RF channel.

The test consists of three consecutive time intervals, with duration of T1, T2 and T3. Cell 1 is active in T1, T2 and T3, whilst Cell 2 and Cell 3 are activated only in the beginning of T2. Cell 2 is active until the end of T3, and Cell 3 is active until the end of T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the reference cell, where the PRS positioning occasion is as defined in Section 8.1.2.5.1. Cell 1 transmits PRS in T2, while Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T2. Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Section 6.5.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.12.1.1-1, Table A.8.12.1.1-2, Table A.8.12.1.1-3 and Table A.8.12.1.1-4.

Table A.8.12.1.1-1: General test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Value	Comment
. aramosor	3	Taido	Reference cell is the cell in the
Reference cell		Cell 1	OTDOA assistance data with respect to which the RSTD measurement is defined, as specified in 3GPP TS 36.214 [4] and 3GPP TS 36.355 [24]. The reference cell is the serving cell in this test case.
Neighbor cells		Cell 2 and Cell 3	Cell 2 and Cell 3 appear at random places in the neighbour cell list in the OTDOA assistance data, but Cell 2 always appears in the first half of the list, whilst Cell 3 appears in the second half of the list.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Transmission Bandwidth	RB	50	PRS are transmitted over the system bandwidth
PRS configuration index $I_{\rm PRS}$		1131	This corresponds to periodicity of 1280 ms and PRS subframe offset of $I_{\rm PRS}$ –1120 DL subframes, as defined in 3GPP
Number of consecutive downlink positioning subframes N_{PRS}		1	TS 36.211 [16], Table 6.10.4.3-1 As defined in 3GPP TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 1 – PCI of Cell 2)mod6=0 and (PCI of Cell 1 – PCI of Cell 3)mod6=0	The cell PCIs are selected such that the relative shifts of PRS patterns among cells are as given by the test parameters
CP length		Normal	
DRX		ON	DRX parameters are further specified in Table A.8.12.1.1-3
Maximum radio frame transmit time offset between the cells at the UE antenna connector Note 1	μs	3	Synchronous cells
Expected RSTD Note 1	μs	3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Number of cells provided in OTDOA assistance data		16	Including the reference cell
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	S	3	The length of the time interval from the beginning of each test
T2	S	5	The length of the time interval that follows immediately after time interval T1
Т3	S	5	The length of the time interval that follows immediately after time interval T2

The true RSTD, which is the receive time difference for frame 0 between each two cells as seen at the Note 1: UE antenna connector, shall be within expected RSTD uncertainty. The true RSTD for Cell 2 and Cell 1 shall be different from the true RSTD for Cell 3 and Cell 1.

Table A.8.12.1.1-2: Cell-specific test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions during T1

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF Channel Number		1	1	1
OCNG patterns defined in A.3.2.1		OP.5 FDD	N/A	N/A
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA	dB	0	N/A	N/A
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA ^{Note 1}				
OCNG_RB ^{Note 1}				
$N_{oc}^{ m Note 3}$	dBm/ 15 kHz		-95	
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$	dB	-Infinity	-Infinity	-Infinity
lo	dBm/ 9 MHz	-64.21	N/A	N/A
$\hat{\mathbf{E}}_{\mathrm{s}}/N_{oc}$	dB	0	-Infinity	-Infinity
Propagation Condition			ETU30	

OCNG shall be used such that active cell (Cell 1) is fully allocated and a constant total Note 1: 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 are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 N_{oc} to be fulfilled.

Table A.8.12.1.1-3: Cell-specific test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions during T2 and T3

Parameter	Unit	Cell 1		Cell 2		Ce	ell 3
		T2	T2 T3		Т3	T2	T3
E-UTRA RF Channel Number		1		1			1
OCNG patterns defined in A.3.2.1		OP.	5 FDD	OP.6	FDD	OP.6 FDD	N/A
PBCH_RA	<u> </u>						
PBCH_RB	<u> </u>						
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB		0	C)	0	N/A
PHICH_RB							
PDCCH_RA							
PDCCH_RB	Ī						
OCNG_RA ^{Note 1}	Ī						
OCNG_RB ^{Note 1}							
PRS_RA	dB	0	N/A	N/A	0	0	N/A
$N_{oc}^{ m Note 3,4}$	dBm/ 15 kHz	-98	-95	-98	-95	-98	-95
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 4}}$	dB	-4	-Infinity	-Infinity	-10	-10	-Infinity
PRS $\hat{E}_{_s}/I_{_{ot}}^{}$ Note 4	dB	-4.41	-Infinity	-Infinity	-10	-11.46	-Infinity
lo Note 4	dBm/ 9 MHz	-69.87	N/A	N/A	-67.15	-69.87	N/A
PRP Note 4	dBm/ 15 kHz	-102	-Infinity	-Infinity	-105	-108	-Infinity
RSRP	dBm/ 15 kHz	-102	-102	-105	-105	-108	-Infinity
Propagation Condition				ETU	130		
constant tota those in the transmitted l	al transmitted subframes v PRS.	d power spe vith transmi	ectral density ted PRS. The	ccept Cell 3 in is achieved fo ere is no PDS ed to the UE p	or all OFDM CH allocated	symbols oth d in the subf	er than rames with

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 are 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: PRS $\hat{E}_{_{\rm S}}/I_{_{\rm ot}}$, Io, and PRP levels have been derived from other parameters and are given for information purpose. These are not settable test parameters. Interference conditions shall be applied to all PRS symbols of DL positioning subframes.

Table A.8.12.1.1-4: DRX parameters for the test of E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Field	Value	Comment
onDurationTimer	psf1	
Drx-InactivityTimer	psf1	As an aified in 2CDD TC
drx-RetransmissionTimer	sf1	As specified in 3GPP TS 36.331 [2], Section 6.3.2
longDRX-CycleStartOffset	sf320	36.331 [2], Section 6.3.2
shortDRX	Disable	

A.8.12.1.2 Test Requirements

The RSTD measurement reporting delay fulfils the requirements specified in Section 8.1.2.5.1.

The UE shall perform and report the RSTD measurements for Cell 2 and Cell 3 with respect to the reference cell in the OTDOA assistance data, Cell 1, within 9280 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%.

NOTE: The RSTD measurement reporting delay in the test is derived from the following expression,

$$T_{PRS}(M-1)+160\left[\frac{n}{M}\right]$$
, where $M=8$ and $n=16$ are the parameters specified in Section 8.1.2.5.1,

Table 8.1.2.5.1-1, under Note 1. This gives the total RSTD reporting delay of 9280 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

A.8.12.2 E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case

A.8.12.2.1 Test Purpose and Environment

The purpose of the test is to verify that the RSTD measurement reporting delay meets the requirements specified in Section 8.1.2.5.2 in an environment with fading propagation conditions.

In the test there are three synchronous cells: Cell 1, Cell 2 and Cell 3. Cell 1 is the reference as well as the serving cell. Cell 2 and Cell 3 are the neighbour cells. All cells are on the same RF channel.

The test consists of three consecutive time intervals, with duration of T1 and T2. Cell 1 is active in T1, T2 and T3, whilst Cell 2 and Cell 3 are activated only in the beginning of T2. Cell 2 is active until the end of T3, and Cell 3 is active until the end of T2. The beginning of the time interval T2 shall be aligned with the first PRS positioning subframe of a positioning occasion in the reference cell, where the PRS positioning occasion is as defined in Section 8.1.2.5.1. Cell 1 transmits PRS in T2, while Cell 2 transmits PRS only in T3, and Cell 3 transmits PRS only in T2. Note: The information on when PRS is muted is conveyed to the UE using PRS muting information.

The OTDOA assistance data as defined in TS 36.355, Section 6.5.1, shall be provided to the UE during T1. The last TTI containing the OTDOA assistance data shall be provided to the UE ΔT ms before the start of T2, where $\Delta T = 150$ ms is the maximum processing time of the OTDOA assistance data.

The test parameters are as given in Table A.8.12.2.1-1, Table A.8.12.2.1-2, Table A.8.12.2.1-3, and Table A.8.12.2.1-4.

Table A.8.12.2.1-1: General test parameters for E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Value	Comment
Reference cell		Cell 1	Reference is the cell in the OTDOA assistance data with respect to which the RSTD measurement is defined, as specified in 3GPP TS 36.214 [4] and 3GPP TS 36.355 [24]. The reference cell is the serving cell in this test case.
Neighbor cells		Cell 2 and Cell 3	Cell 2 and Cell 3 appear at random places in the neighbour cell list in the OTDOA assistance data, but Cell 2 always appears in the first half of the list, whilst Cell 3 appears in the second half of the list.
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Channel Bandwidth (BW _{channel})	MHz	10	
PRS Transmission Bandwidth	RB	50	PRS are transmitted over the system bandwidth
PRS configuration index $I_{\rm PRS}$		1134	This corresponds to periodicity of 1280 ms and PRS subframe offset of $I_{\rm PRS}$ –1120 DL subframes, as defined in 3GPP TS 36.211 [16], Table 6.10.4.3-1
Number of consecutive downlink positioning subframes N_{PRS}		1	As defined in 3GPP TS 36.211 [16]. The number of subframes in a positioning occasion
Physical cell ID PCI		(PCI of Cell 1 – PCI of Cell 2)mod6=0 and (PCI of Cell 1 – PCI of Cell 3)mod6=0	The cell PCIs are selected such that the relative shifts of PRS patterns among cells are as given by the test parameters
TDD uplink-downlink configuration		1	As specified in TS 36.211 [16], Section 4.2; corresponds to a configuration with 5 ms switch-point periodicity and two downlink consecutive subframes
TDD special subframe configuration		6	As specified in TS 36.211 [16], Section 4.2; corresponds to DwPTS of $19760 \cdot T_{\rm s}$ and UpPTS of $4384 \cdot T_{\rm s}$
CP length		Normal	The same CP length applies for DL and UL
DRX		ON	DRX parameters are further specified in Table A.8.12.2.1-3
Maximum radio frame transmit time offset between the cells at the UE antenna connector Note 1	μs	3	Synchronous cells
Expected RSTD Note 1	μs	3	The expected RSTD is what is expected at the receiver. The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD indicator
Expected RSTD uncertainty	μs	5	The corresponding parameter in the OTDOA assistance data specified in TS 36.355 [24] is the expectedRSTD-Uncertainty index
Number of cells provided in OTDOA assistance data		16	Including the reference cell
PRS muting info		Cell 1: '11110000' Cell 2: '00001111' Cell 3: '11110000'	Correponds to prs-MutingInfo defined in TS 36.355 [24]
T1	S	3	The length of the time interval from the beginning of each test
T2	S	5	The length of the time interval that follows immediately after time interval T1

Т3		s	5	The length of the time interval that follows immediately after time interval T2					
Note 1:	•		ne receive time difference for frame 0 bet						
	antenna connector, shall be within expected RSTD uncertainty. The true RSTD for Cell 2 and Cell 1 shall be								
	different from the	true RST	D for Cell 3 and Cell 1.						

Table A.8.12.2.1-2: Cell-specific test parameters for E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions during T1

Parameter	Unit	Cell 1	Cell 2	Cell 3
E-UTRA RF		1	1	1
Channel Number		1	·	'
OCNG patterns		OP.1 TDD	N/A	N/A
defined in A.3.2.2		01.1100	14/7	14/71
PBCH_RA Note 6	1			
PBCH_RB Note 6				
PSS_RA Note 6				
SSS_RA Note 6				
PCFICH_RB				
PHICH_RA	dB	0	N/A	NI/A
PHICH_RB	ub	U		N/A
PDCCH_RA	1			
PDCCH_RB	Ī			
OCNG_RA ^{Note 1}	Ī			
OCNG_RB ^{Note 1}	1			
PRS_RA	Ī			
$N_{oc}^{ m Note~3,5}$	dBm/ 15 kHz		-95	
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note}5}$	dB	-Infinity	-Infinity	-Infinity
lo Note 4	dBm/ 9 MHz	-64.21	N/A	N/A
$\hat{E}_{_{S}}/I_{_{ot}}$ Note 4	dB	0	-Infinity	-Infinity
Propagation Condition			ETU30	

Note 1: OCNG shall be used such that active cell (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.

Note 3: Interference from other cells and noise sources not specified in the test are assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

constant over subcarriers and time and snail be modelled as Avvolv or appropria

 $N_{\it oc}$ to be fulfilled.

Table A.8.12.2.1-3: Cell-specific test parameters for E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Parameter	Unit	Ce	II 1	Cell 2		Cell 3		
		T2	T3	T2	Т3	T2	T3	
E-UTRA RF		,	1	1		1		
Channel Number		'		1				
OCNG patterns		OP.1	TDD	OP.2	TDD	OP.2	N/A	
defined in A.3.2.2 PBCH_RA Note 6		• • • • • • • • • • • • • • • • • • • •				TDD	,	
	<u> </u>							
PBCH_RB Note 6	<u> </u>							
PSS_RA Note 6	<u> </u>							
SSS_RA Note 6	1							
PCFICH_RB								
PHICH_RA	dB	()	0		0	N/A	
PHICH_RB								
PDCCH_RA								
PDCCH_RB								
OCNG_RA ^{Note 1}	Ī							
OCNG_RB ^{Note 1}	1							
PRS_RA	dB	0	N/A	N/A	0	0	N/A	
N_{oc} Note 3,4	dBm/ 15 kHz	-98	-95	-98	-95	-98	-95	
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}^{\mathrm{Note 5}}$	dB	-4	-Infinity	-Infinity	-10	-10	-Infinity	
PRS $\hat{E}_{_{s}}/I_{_{ot}}^{}$ Note 4	dB	-4.41	-Infinity	-Infinity	-10	-11.46	-Infinity	
Io Note 4	dBm/ 9 MHz	-69.87	N/A	N/A	-67.15	-69.87	N/A	
PRP Note 4	dBm/ 15 kHz	-102	-Infinity	-Infinity	-105	-108	-Infinity	
RSRP	dBm/ 15 kHz	-102	-102	-105	-105	-108	-Infinity	
Propagation Condition				ETU	30			
Note 1: OCNG shall constant total those in the transmitted Note 2: The resource	all be used such that active cells (all, except Cell 3 in T3) are fully allocated and a obtal transmitted power spectral density is achieved for all OFDM symbols other than be subframes with transmitted PRS. There is no PDSCH allocated in the subframes with d PRS. reso for uplink transmission are assigned to the UE prior to the start of time period T2. the prior of the cells and noise sources not specified in the test and assumed to be							
constant over	er subcarriers	s and time and shall be modelled as AWGN of appropriate power for						
N_{oc} to be								
Note 4: PRS \hat{E}_s/I_{ot}	, Io, and PR	RP levels have been derived from other parameters and are given for						
	ourpose. The	ese are not s	settable test	parameters. Ir				

Table A.8.12.2.1-4: DRX parameters for the test of E-UTRAN TDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Field	Value	Comment
onDurationTimer	psf1	
drx-InactivityTimer	psf1	As appointed in 2CDD TO
drx-RetransmissionTimer	sf1	As specified in 3GPP TS 36.331 [2], Section 6.3.2.
longDRX-CycleStartOffset	sf320	36.331 [2], Section 6.3.2.
shortDRX	disable	

A.8.12.2.2 Test Requirements

The RSTD measurement reporting delay fulfils the requirements specified in Section 8.1.2.5.2.

The UE shall perform and report the RSTD measurements for Cell 2 and Cell 3 with respect to the reference cell in the OTDOA assistance data, Cell 1, within 9280 ms starting from the beginning of time interval T2.

The rate of the correct events for each neighbour cell observed during repeated tests shall be at least 90%.

NOTE: The RSTD measurement reporting delay in the test is derived from the following expression,

$$T_{PRS}(M-1)+160\left|\frac{n}{M}\right|$$
, where $M=8$ and $n=16$ are the parameters specified for this test case in

Section 8.1.2.5.2, Table 8.1.2.5.2-1, under Note 1. This gives the total RSTD reporting delay of 9280 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

A.8.13 RSTD Inter-frequency Measurements

Editor's note: TBD

A.9 Measurement Performance Requirements

Unless explicitly stated otherwise:

- Reported measurements shall be within defined range of accuracy limits defined in Section 9 for 90 % of the reported cases.
- Cell 1 is the serving cell.
- Measurements are performed in RRC_CONNECTED state.
- The reference channels assume transmission of PDSCH with a maximum number of 5 HARQ transmissions unless otherwise specified.

A.9.1 RSRP

A.9.1.1 FDD Intra frequency case

A.9.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.2 for FDD intra frequency measurements.

A.9.1.1.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.1.2-1. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell.

Table A.9.1.1.2-1: RSRP\ FDD Intra frequency test parameters

De			Test 1		Test 2		Test 3	
	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	nannel Number			1		•	1	
BW _{channel}		MHz		0	10		10	
Measurement b		n_{PRB}		–27	22—27		22—27	
channel define	ence measurement d in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocat	ion	n_{PRB}	13—36	-	13—36	-	13—36	-
measurement of A.3.1.2.1	H/PHICH Reference channel defined in		R.6	FDD	R.6	FDD	R.6	FDD
(OP.1 FDD) an FDD)	s defined in A.3.2.1.1 d A.3.2.1.2 (OP.2		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		dB	0	0	0	0	0	0
PDSCH_RA PDSCH_RB OCNG_RA ^{Note1}								
OCNG_RB ^{Note1}								
$N_{oc}^{ m Note2}$	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24 Bands 2, 5 and 7	dDm/45 kHz	106	106	00	00	-1 -1	
	Bands 3, 8, 12, 13, 14, 17 and 20	dBm/15 kHz	-106	-106	-88	-88	-1	13
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	Band 9	dB	2.5	-6	2.5	-6	0.46	-5.76
s/*ot	Bands 1, 4, 6, 10, 11, 18, 19, 21 and	40	2.0		2.0		-113	-117
RSRP ^{Note3}	24 Bands 2, 5 and 7	dBm/15 kHz	-100	-105	-82	-87	-111	-115
	Bands 3, 8, 12, 13, 14, 17 and 20						-110	-114
	Band 9						-112	-116
	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24						-82.43	
lo ^{Note3}	Bands 2, 5 and 7	dBm/9 MHz	-70.27	-70.27	-52.27	-52.27	-80	.43
	Bands 3, 8, 12, 13, 14, 17 and 20 Band 9						-79.43 -81.43	
\hat{E}_s/N_{oc}	<u> </u>	dB	6	1	6	1	3	. 40 -1
Propagation co	ndition	-	AW			'GN	AW	
	nall be used such that both	r cells are fully all						

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 lo 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.

A.9.1.1.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in section 9.1.2.

A.9.1.2 TDD Intra frequency case

A.9.1.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.2 for TDD intra frequency measurements.

A.9.1.2.2 Test parameters

In this set of test cases all cells are on the same carrier frequency. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.2.2-1. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell.

Table A.9.1.2.2-1: RSRP TDD Intra frequency test parameters

Parameter		Unit	Tes	st 1	Test 2		Test 3	
		Offic	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	annel Number			1	1		,	
BW _{channel}		MHz	1	0	10		10	
Special subfran	e1		6	3	6		6	
Uplink/downlink	configurationNote1		,	1	,	1	,	
Measurement b		n_{PRB}	22-	–27	22-	–27	22-	–27
PDSCH Refere channel defined	nce measurement d in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocat		n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC Reference mea defined in A.3.1	surement channel		R.6	TDD	R.6	TDD	R.6	TDD
OCNG Patterns A.3.2.2.1 (OP.1 A.3.2.2.2 (OP.2	TDD) and		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_RA PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB Note2	Bands 33, 34, 35,	dB	0	0	0	0	0	0
$N_{oc}^{ m Note3}$	36, 37, 38, 39, 40, 42, 43 Band 41	dBm/15 kHz	-106	-106	-88	-88		16 15
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	Dana 41	dB	2.5	-6	2.5	-6	0.5	-5.76
RSRP ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/15 kHz	-100	-105	-82	-87	-113	-117
	Band 41						-112	-116
Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43		dBm/9 MHz	-70.27	-70.27	-52.27	-52.27	-82	.43
	Band 41						-81.43	
\hat{E}_s/N_{oc}		dB	6	1	6	1	3	-1
Propagation co	ndition		AW	GN	AW	GN		GN

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 lo 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.

A.9.1.2.3 Test Requirements

The RSRP measurement accuracy shall fulfil the requirements in section 9.1.2.

A.9.1.3 FDD—FDD Inter frequency case

A.9.1.3.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.3 for FDD—FDD inter frequency measurements.

A.9.1.3.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.3.2-1 In all test cases, Cell 1 is the serving cell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.1.3.2-1: RSRP FDD—FDD Inter frequency test parameters

Parameter		Unit		st 1	Test 2		
_		J	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Ch	nannel Number	MHz	1 10	2	1 10	2	
BW _{channel} Gap Pattern Id		IVIDZ	10	10	10	10	
				l	-	l	
Measurement I		n_{PRB}		- 27		- 27	
channel define	ence measurement d in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	
PDSCH allocat	ion	$n_{\scriptscriptstyle PRB}$	13—36	-	13—36	-	
	CH/PHICH Reference channel defined in		R.6	FDD	R.6	FDD	
	s defined in A.3.2.1.1		OP.1	OP.2	OP.1	OP.2	
PBCH RA	d A.3.2.1.2 (OP.2 FDD)		FDD	FDD	FDD	FDD	
PBCH RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA				_	_	_	
PHICH_RB		dB	0	0	0	0	
PDCCH_RA							
PDCCH_RB PDSCH_RA							
PDSCH_RB							
OCNG_RANot	e1						
OCNG RBNot							
A 7 Note2	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24				-109	-117	
$N_{oc}^{$	Bands 2, 5 and 7	dBm/15 kHz	-88.65	-88.65	-107	-115	
	Bands 3, 8, 12, 13, 14, 17 and 20				-106	-114	
	Band 9				-108	-116	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	10	10	14	-4	
	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24				-95	-121	
RSRP ^{Note3}	Bands 2, 5 and 7	dBm/15 kHz	-78.65	-78.65	-93	-119	
	Bands 3, 8, 12, 13, 14, 17 and 20				-92	-118	
	Band 9				-94	-120	
	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24				-67.05	-87.76	
Io ^{Note3}	Bands 2, 5 and 7	dBm/9 MHz	-50.45	-50.45	-65.05	-85.76	
	Bands 3, 8, 12, 13, 14, 17 and 20				-64.05	-84.76	
	Band 9				-66.05	-86.76	
\hat{E}_s/N_{oc}		dB	10	10	14	-4	
Propagation co		-		'GN		'GN	
	CNG shall be used such nsmitted power spectra					total	
	erference from other co					assumed	

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 $\frac{N_{oc}}{N_{oc}}$ to be fulfilled. RSRP and lo levels have been derived from other parameters for information Note 3: purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

A.9.1.3.3 **Test Requirements**

The RSRP measurement accuracy shall fulfil the requirements in section 9.1.3.

A.9.1.4 TDD—TDD Inter frequency case

A.9.1.4.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRP measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.3 for TDD—TDD inter frequency measurements.

A.9.1.4.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP intra frequency measurements are tested by using the parameters in Table A.9.1.4.2-1. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.1.4.2-1: RSRP TDD—TDD Inter frequency test parameters

			Test 1 Test 2				
	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Cha	nnel Number		1	2	1	2	
BW _{channel}	e configuration ^{Note1}	MHz	10	10 6	10	10 6	
Uplink-downlink			1			<u>. </u>	
Gap Pattern Id			0	-	0	-	
Measurement ba	ındwidth	$n_{\scriptscriptstyle PRB}$	22-	– 27	22-	–27	
PDSCH Referen	ce measurement in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	
PDSCH allocation	n	$n_{\scriptscriptstyle PRB}$	13—36	-	13—36	-	
PDCCH/PCFICH measurement ch A.3.1.2.2	I/PHICH Reference cannel defined in		R.6	TDD	R.6	TDD	
	defined in A.3.2.2.1 A.3.2.2.2 (OP.2 TDD)		OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RA PDSCH_RA	7.002.2.2 (01.2.130)	dB	0	0	0	0	
PDSCH_RB OCNG_RA ^{Note2} OCNG_RB ^{Note2}	Bands 33, 34, 35,						
$N_{oc}^{ m Note3}$	36, 37, 38, 39, 40, 42, 43	dBm/15 kHz	-88.65	-88.65	-109	-117	
	Band 41					-115	
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	10	10	14	-4	
RSRP ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/15 kHz	-78.65	-78.65	-95	-121	
	Band 41					-120	
lo ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/9 MHz	-50.45	-50.45	-67.05	-87.76	
	Band 41					-86.03	
\hat{E}_s/N_{oc}		dB	10	10	14	-4	
Propagation con		-		GN		'GN	
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						total	
Note 4: RSF	ropriate power for N_{α} RP and lo levels have	been derived from			or informati	on	

purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Test Requirements A.9.1.4.3

The RSRP measurement accuracy shall fulfil the requirements in section 9.1.3.

A.9.2 RSRQ

A.9.2.1 FDD Intra frequency case

A.9.2.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.5.

A.9.2.1.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.1.2-1. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell.

Table A.9.2.1.2-1: RSRQ FDD Intra frequency test parameters

Ps	arameter	Unit		st 1		st 2	Tes	
		Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	annel Number	MHz		<u>1</u> 0		<u>1</u> 0		<u>1</u> 0
BW _{channel}								
Measurement ba		n_{PRB}		–27 I		- 27		- 27
channel defined	ce measurement in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	R.0 FDD	ı
PDSCH allocation	on	n_{PRB}	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH measurement ch A.3.1.2.1	H/PHICH Reference nannel defined in		R.6	FDD	R.6	FDD	R.6	FDD
OCNG Patterns	defined in A.3.2.1.1 A.3.2.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA	(01.12.12.7							
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB PHICH_RA								
PHICH RB		dB	0	0	0	0	0	0
PDCCH_RA		uБ	U	U	U	U	U	U
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA ^{Note1}								
OCNG_RB ^{Note1}								
N.I. Note?	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24						-1	16
$N_{_{oc}}^{^{Note2}}$	Bands 2, 5 and 7	dBm/15 kHz	-84.76	-84.76	-103.85	-103.85	-114	
	Bands 3, 8, 12, 13, 14, 17 and 20						-1	13
	Band 9						-1	15
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24						-120	-120
RSRP ^{Note3}	Bands 2, 5 and 7	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-118	-118
	Bands 3, 8, 12, 13, 14, 17 and 20						-117	-117
	Band 9						-119	-119
	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24							
RSRQ ^{Note3}	Bands 2, 5 and 7	dB	-14.77	-14.77	-16.76	-16.76	-17.33	-17.33
	Bands 3, 8, 12, 13,							
	14, 17 and 20 Band 9							
	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24						-85	.67
Io ^{Note3}	Bands 2, 5 and 7	dBm/9 MHz	-50	-50	-73	-73	-83	.67
	Bands 3, 8, 12, 13,	GDIII/O IVII IZ			, ,			.67
	14, 17 and 20 Band 9							.67
A /27	שמווע ט							
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4
Propagation con	dition hall be used such that be	- oth colle are fully all		GN	1	GN tod power a		'GN

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 lo 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.

A.9.2.1.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Section 9.1.5.

A.9.2.2 TDD Intra frequency case

A.9.2.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.5.

A.9.2.2.2 Test parameters

In this test case all cells are on the same carrier frequency. The absolute accuracy of RSRQ intra frequency measurement is tested by using the parameters in Table A.9.2.2.2-1. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell.

Table A.9.2.2.2-1: RSRQ TDD Intra frequency test parameters

D		l lmit	Tes	st 1	Tes	st 2	Tes	st 3
	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	annel Number			-		1		1
BW _{channel}	r . Note1	MHz		0	1	0		0
Special subfram	e configuration ^{Note1} configuration ^{Note1}			5		6 1		<u>3</u> 1
· ·								
Measurement ba		$n_{\it PRB}$		–27		–27		–27
PDSCH Referer channel defined	ice measurement in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation	on	$n_{\it PRB}$	13—36	-	13—36	-	13—36	-
measurement ch A.3.1.2.2	H/PHICH Reference nannel defined in			TDD		TDD		TDD
	defined in A.3.2.2.1 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_RA PDCCH_RA PDCCH_RA PDCCH_RA PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA OCNG_RB Note3	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43 Band 41	dB dBm/15 kHz	-84.76	-84.76	0 -103.85	-103.85	-1	0
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
RSRP ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-120	-120
	Band 41						-119	-119
RSRQ ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43	dB	-14.77	-14.77	-16.76	-16.76	-17.33	-17.33
lo ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/9 MHz	-50	-50	-73	-73	-85	.67
	Band 41						-84	.67
\hat{E}_s/N_{oc}		dB	3	3	-2.9	-2.9	-4	-4
Propagation con	dition	-	AW	GN	AW	'GN	AW	'GN
	cial subframe and uplink-	downlink configurat	ions see Tal	ales 4 2-1 a				

A.9.2.2.3 **Test Requirements**

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.5.

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 lo 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.

A.9.2.3 FDD—FDD Inter frequency case

A.9.2.3.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.6.

A.9.2.3.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.3.2-1. In all tests, Cell 1 is the serving cell and Cell 2 the target cell.

Table A.9.2.3.2-1: RSRQ FDD—FDD Inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
Faiailletei	Onit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2

Note 3:

	nannel Number		1	2	1	2	1	2
BW _{channel}		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement I		n_{PRB}	22-	–27	22-	–27	22—	·27
PDSCH Refere channel define	ence measurement d in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocat		n_{PRB}	13—36	-	13—36	-	13—36	-
	CH/PHICH Reference channel defined in		R.6	FDD	R.6	FDD	R.6 F	DD
OCNG Pattern	s defined in A.3.2.1.1 nd A.3.2.1.2 (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_RA		dB	0	0	0	0	0	0
OCNG_RA ^{Note1}								
$N_{oc}^{$	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24	JD (45 LLL-	00	00	404.70	404.70	-119.50	-119.50
OC.	Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	dBm/15 kHz	-80	-80	-104.70	-104.70	-117.50 -116.50 -118.50	-117.50 -116.50 -118.50
\hat{E}_{s}/I_{ot}	24	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
	Bands 1, 4, 6, 10, 11, 18,19, 21 and 24						-123.50	-123.50
RSRP ^{Note3}	Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70	-121.50 -120.50 -122.50	-121.50 -120.50 -122.50
RSRQ ^{Note3}	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24 Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
lo ^{Note3}	Bands 1, 4, 6, 10, 11, 18, 19, 21 and 24 Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	dBm/9 MHz	-50	-50	-75.46	-75.46	-90.26 -88.26 -87.26	-90.26 -88.26 -87.26
\hat{E}_s/N_{oc}	j banu 9	dB	-1.75	-1.75	-4.0	-4.0	-89.26 -4.0	-89.26 -4.0
Propagation co	ondition	-	AW	'GN	AW	/GN	AWC	SN_

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. RSRQ, RSRP and lo 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.

A.9.2.3.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Section 9.1.6.

A.9.2.4 TDD—TDD Inter frequency case

A.9.2.4.1 Test Purpose and Environment

The purpose of this test is to verify that the RSRQ measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.1.6.

A.9.2.4.2 Test parameters

In this test case the two cells are on different carrier frequencies and measurement gaps are provided. Both RSRQ inter frequency absolute and relative accuracy requirements are tested by using test parameters in Table A.9.2.4.2-1. In all tests, Cell 1 is the serving cell and Cell 2 the target cell.

Table A 9.2.4.2-1: RSRQ TDD—TDD Inter frequency test parameters

		l lm!s	Tes	st 1	Test 2		Test 3	
P	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	nannel Number		1	2	1	2	1	2
BW _{channel}		MHz	10	10	10	10	10	10
Gap Pattern Id	Natad		0	-	0	-	0	-
Special subfran	ne configuration Note1		(6	6			6
Uplink-downlink	configuration Note1		,	1	1			1
Measurement b		n_{PRB}	22-	–27	22—	-27	22-	- 27
PDSCH Refere channel defined	nce measurement d in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocat	ion	$n_{\it PRB}$	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC	:H/PHICH Reference							•
measurement of	channel defined in		R.6	TDD	R.6 T	DD	R.6	TDD
A.3.1.2.2								
	s defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
	d A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	TDD	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}		dB	0	0	0	0	0	0
OCNG_RB ^{Note2}	I B							
$N_{oc}^{ m Note3}$	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/15 kHz	-80	-80	-104.70	- 104.70	-119.50	-119.50
	Band 41					101170	-118	-118
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
RSRP ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/15 kHz	-81.75	-81.75	-108.70	- 108.70	-123.50	-123.50
	Band 41						-122.50	-122.50
RSRQ ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
Io ^{Note4}	Bands 33, 34, 35, 36, 37, 38, 39, 40, 42, 43	dBm/9 MHz	-50	-50	-74.95	-74.95	-89.90	-89.90
	Band 41						-88.90	-88.90
\hat{E}_s/N_{oc}		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
Propagation co	ndition	-	AW	'GN	AWO	GN .	ΑW	/GN
	cial subframe and uplink-	downlink configurat						

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

A.9.2.4.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Section 9.1.6.

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 lo 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.

A.9.3 UTRAN FDD CPICH RSCP

A.9.3.1 E-UTRAN FDD

A.9.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.2.1. There are two different test setups with different UTRAN parameters.

A.9.3.1.2 Parameters

The test parameters are given in Tables A.9.3.1.2-1, A.9.3.1.2-2 and A.9.3.1.2-3 below.

Table A.9.3.1.2-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
E-UTRAN RF Channel		1	One E-UTRAN FDD carrier frequency is
Number			used.
UTRAN RF Channel		1	One UTRAN FDD carrier frequency is
Number			used.
E-UTRAN Channel	MHz	10	
Bandwidth (BW _{channel})			
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD)		CPICH RSCP	0.11.2.11
measurement quantity			
Monitored UTRA FDD cell		12	UTRA cells on UTRA RF channel 1
list size			provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.3.1.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2		
E-UTRAN RF Channel		<u> </u>			
Number			1		
BW _{channel}	MHz	1	0		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD			
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA ^{Note 1}	dB				
OCNG_RB ^{Note 1}	dB				
N _{oc} Note 2	dBm/15 kHz	-9	98		
RSRP Note 3	dBm/15 kHz	-(94		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB		4		
SCH_RP Note 3	dBm/15 kHz	-(94		
\hat{E}_s/N_{oc}	dB		4		
Propagation Condition			/GN		

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

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

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

Table A.9.3.1.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

	Parameter	Unit	Test 1	Test 2
			Cell 2	Cell 2
	CPICH_Ec/lor	dB	-10	-10
	PCCPCH_Ec/lor	dB	-12	-12
	SCH_Ec/lor	dB	-12	-12
	PICH_Ec/lor	dB	-15	-15
	DPCH_Ec/lor	dB	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94
loc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz		-94.46
	Band II, V, VII		-60.00	-92.46
	Band III, VIII, XII, XIII, XIV			-91.46
	Band IX (Note 2)			-93.46
	Îor/loc	dB	9.54	-9.54
CPICH RSCP,	Band I, IV, VI, X, XI, XIX, XXI	dBm		-114.0
Note 1	Band II, V, VII		-60.46	-112.0
	Band III, VIII, XII, XIII, XIV			-111.0
	Band IX (Note 2)			-113.0
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz		-94.0
	Band II, V, VII		-50.00	-92.0
	Band III, VIII, XII, XIII, XIV	1		-91.0
	Band IX (Note 2)	1		-93.0
	opagation condition	-	AWGN	AWGN
NOTE 1: C	CPICH RSCP and lo levels have	been calculat	ted from other parameters for i	nformation purposes.

NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.3.1.3 Test Requirements

The CPICH RSCP measurement absolute accuracy shall meet the requirements in Section 9.2.1.

A.9.3.2 E-UTRAN TDD

A.9.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.2.1. There are three different test setups with different UTRAN parameters.

A.9.3.2.2 Parameters

The test parameters are given in Tables A.9.3.2.2-1, A.9.3.2.2-2 and A.9.3.2.2-3 below.

Table A.9.3.2.2-1: General test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH RSCP	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.3.2.2-2: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1 Test 2	
E-UTRAN RF Channel Number			1
BW _{channel}	MHz	,	<u>1</u> 10
Special subframe configuration Note1		6	
Uplink-downlink configuration Note1		1	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)		OP.1 TDD	

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 2}	dB	
OCNG_RB ^{Note 2}	dB	
N _{oc} Note 3	dBm/15 kHz	-98
RSRP Note 4	dBm/15 kHz	-94
\hat{E}_{s}/I_{ot}	dB	4
SCH_RP Note 4	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN
		. T.I. 404 I400: 00DD T0

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.9.3.2.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	
		Cell 2	Cell 2	

Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.

	CPICH_Ec/lor	dB	-10	-10
	PCCPCH_Ec/lor		-12	-12
SCH_Ec/lor		dB	-12	-12
	PICH_Ec/lor		-15	-15
	DPCH_Ec/lor	dB	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94
loc	Band I, IV, VI, X, XI, XIX,	dBm/3.84		-94.46
	XXI	MHz		
	Band II, V, VII		-60.00	-92.46
	Band III, VIII, XII, XIII, XIV			-91.46
	Band IX (Note 2)			-93.46
	Îor/loc		9.54	-9.54
CPICH	Band I, IV, VI, X, XI, XIX,	dBm		-114.0
RSCP,	XXI			
Note 1	Band II, V, VII		-60.46	-112.0
	Band III, VIII, XII, XIII, XIV			-111.0
	Band IX (Note 2)			-113.0
Io, Note 1	Band I, IV, VI, X, XI, XIX,	dBm/3.84		-94.0
	XXI	MHz		
	Band II, V, VII]	-50.00	-92.0
	Band III, VIII, XII, XIII, XIV			-91.0
	Band IX (Note 2)			-93.0
	opagation condition	-	AWGN	AWGN
NOTE 4.	COLOUR DOOD and In lavely have	h		

NOTE 1: CPICH RSCP and lo levels have been calculated from other parameters for information purposes.

They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for test 2 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.3.2.3 Test Requirements

The CPICH RSCP measurement absolute accuracy shall meet the requirements in Section 9.2.1.

A.9.4 UTRAN FDD CPICH Ec/No

A.9.4.1 E-UTRAN FDD

A.9.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/No absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.2.3. There are three different test setups with different UTRAN parameters.

A.9.4.1.2 Parameters

The test parameters are given in Tables A.9.4.1.2-1, A.9.4.1.2-2 and A.9.4.1.2-3 below.

Table A.9.4.1.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
E-UTRAN RF Channel		1	One E-UTRAN FDD carrier frequency is
Number			used.
UTRAN RF Channel		1	One UTRAN FDD carrier frequency is
Number			used.
E-UTRAN Channel	MHz	10	
Bandwidth (BW _{channel})			
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section
			8.1.2.1.
Inter-RAT (UTRAN FDD)		CPICH Ec/N0	
measurement quantity			
Monitored UTRA FDD cell		12	UTRA cells on UTRA RF channel 1
list size			provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.4.1.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Test 1	Test 2	Test 3	
E-UTRAN RF Channel Number		1			
BW _{channel}	MHz		10		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)			OP.1 FDD		

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
\hat{E}_{s}/I_{ot}	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN
		I .

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

Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes.

They are not settable parameters themselves.

Table A.9.4.1.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter		Unit	Test 1	Test 2	Test 3
	Parameter	Unit	Cell 2	Cell 2	Cell 2
CPICH_Ec/lor		dB	-10	-10	-10
F	PCCPCH_Ec/lor	dB	-12	-12	-12
	SCH_Ec/lor	dB	-12	-12	-12
	PICH_Ec/lor	dB	-15	-15	-15
	DPCH_Ec/lor	dB	ı	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94	-0.94
	Band I, IV, VI, X, XI, XIX, XXI	dD.co./			-94.46
laa	Band II, V, VII	dBm/	50.00	-87.27	-92.46
IOC	Band III, VIII, XII, XIII, XIV	3.84 MHz	-52.22		-91.46
	Band IX (Note 2)				-93.46
	Îor/loc	dB	-1.75	-4.7	-9.54
CP	ICH Ec/Io, Note 1	dBm	-14.0	-16.0	-20.0
	Band I, IV, VI, X, XI, XIX, XXI	dD.co./			-94
lo,	Band II, V, VII	dBm/	F.O.	86	-92.0
Note 1	Band III, VIII, XII, XIII, XIV	3.84 MHz	-50	-86	-91.0
	Band IX (Note 2)				-93
Pro	pagation condition	-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

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

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.4.1.3 Test Requirements

The CPICH Ec/No measurement absolute accuracy shall meet the requirements in Section 9.2.3.

A.9.4.2 E-UTRAN TDD

A.9.4.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/No absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.2.3. There are three different test setups with different UTRAN parameters.

A.9.4.2.2 Parameters

The test parameters are given in Tables A.9.4.2.2-1, A.9.4.2.2-2 and A.9.4.2.2-3 below.

Table A.9.4.2.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW _{channel})	MHz	10	
Active cell		Cell 1	E-UTRAN cell 1 on RF channel number 1
Neighbor cells		Cell 2	UTRAN cell 2 on RF channel number 1
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list.
CP length		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF

Table A.9.4.2.2-2: E-UTRAN TDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRAN RF Channel Number			1	
BW _{channel}	MHz		10	
Special subframe configuration Note1			6	
Uplink-downlink configuration Note1			1	
OCNG Patterns defined in A.3.2.1.2 (OP.1 TDD)			OP.1 TDD	

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 2}	dB	
OCNG_RB ^{Note 2}	dB	
Noc Note 3	dBm/15	-98
	kHz	-90
RSRP Note 4	dBm/15	-94
	kHz	-37
\hat{E}_{s}/I_{ot}	dB	4
SCH_RP Note 4	dBm/15	-94
	kHz	*3 4
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN
		: TIL 101 L100: 00DD T0

Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.

- Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled
- Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.9.4.2.2-3: UTRAN FDD cell specific test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

	Parameter	Unit	Test 1 Cell 2	Test 2 Cell 2	Test 3 Cell 2
	CPICH Ec/lor	dB	-10	-10	-10
F	PCCPCH_Ec/lor	dB	-12	-12	-12
	SCH_Ec/lor	dB	-12	-12	-12
	PICH_Ec/lor	dB	-15	-15	-15
	DPCH_Ec/lor	dB	-	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94	-0.94
	Band I, IV, VI, X, XI, XIX, XXI	ID /			-94.46
loo	loc Band II, V, VII Band III, VIII, XII, XIII, XIV	dBm/	84 -52.22	-87.27	-92.46
100		MHz			-91.46
	Band IX (Note 2)				-93.46
	Îor/loc	dB	-1.75	-4.7	-9.54
CP	PICH Ec/Io, Note 1	dBm	-14.0	-16.0	-20.0
	Band I, IV, VI, X, XI, XIX, XXI	-ID/			-94
lo, Note	Band II, V, VII	dBm/ 3.84	-50	-86	-92.0
1	Band III, VIII, XII, XIII, XIV	MHz	-50	-00	-91.0
	Band IX (Note 2)				-93
Pro	pagation condition	-	AWGN	AWGN	AWGN

NOTE 1: CPICH Ec/lo and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

NOTE 2: For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.

Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.

A.9.4.2.3 Test Requirements

The CPICH Ec/No measurement absolute accuracy shall meet the requirements in Section 9.2.3.

A.9.5 UTRAN TDD measurement

A.9.5.1 P-CCPCH RSCP absolute accuracy for E-UTRAN FDD

A.9.5.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRAN TDD P-CCPCH RSCP measurement absolute accuracy is within the specified limits. This test will verify the requirements in section 9.3.1 and applies to UE supporting this capability.

Gap pattern configuration with id #1 as specified in Table 8.1.2.1-1 is provided. In the measurement control information it is indicated to the UE that periodic reporting of the UTRA TDD P-CCPCH RSRP measurement is used.

A.9.5.1.2 Test parameters

In this set of test cases there are two cells. Cell 1 is a E-UTRA FDD cell and cell 2 is a UTRA TDD cell. The absolute accuracy of P-CCPCH RSCP measurements are tested by using test parameters in Table A.9.5.1-1, Table A.9.5.1-2, and Table A.9.5.1-3. In all test cases, Cell 1 is the serving cell and Cell 2 is the target cell.

Table A.9.5.1-1: General test parameters for UTRA TDD P-CCPCH RSCP measurement absolute accuracy in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRAN FDD cell 1 on RF channel number 1
Neighbor cells		Cell 2	1.28Mcps UTRA TDD cell 2 on RF channel number 2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
CP length of cell 1		Normal	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSRP	

Table A.9.5.1-2: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 1)

Parameter	Unit	Test 1	Test 2	Test 3	
E-UTRA RF Channel Number			1		
BWchannel	MHz		1 10 OP.1 FDD		
OCNG Patterns defined in A.3.2.1.1 (OP.1			7D 1 EDD	1	
FDD)		'	JF.I FDL		
PBCH_RA					
PBCH_RB					
PSS_RA					
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB	dB		0		
PDCCH_RA		Ü			
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA ^{Note1}					
OCNG_RB ^{Note1}					
$N_{oc}^{ m Note2}$	dBm/15 kHz		-98		
\hat{E}_s / I_{ot}	dB	4 -94			
RSRP ^{Note3}	dBm/15 kHz				
Io ^{Note3}	dBm/9 MHz		-64.76		
\hat{E}_s / N_{oc}	dB		4		
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 $^{\begin{subarray}{c} \begin{subarray}{c} \begin{s} \begin{subarray}{c} \begin{subarray}{c} \begin{subarray}{c} \b$

Note 3: RSRP and lo 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 A.9.5.1-3: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 2)

Parameter	Unit	Test 1		Test 2		Test 3	
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Chan	nel 2	Channel 2		Char	nel 2
PCCPCH_Ec/lor	dB	-3		-3		-3	
DwPCH_Ec/lor	dB		0		0		0
OCNS_Ec/lor	dB	-3		-3		-3	
loc	dBm/1.28MHz	-54	4.1	-75	5.2	-(97
Îor/loc	dB	2	2 5)	
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
lo Note1	dBm/1.28MHz	-50		-50 -69		-(94
Propagation condition			AWGN				

Note 1: PCCPCH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

A.9.5.1.3 Test Requirements

The UTRA TDD P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.3.1.

A.9.5.2 P-CCPCH RSCP absolute accuracy for E-UTRAN TDD

A.9.5.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UTRAN TDD P-CCPCH RSCP measurement accuracy is within the specified limits. This test will verify the requirements in section 9.3.1 and applies to UE supporting this capability.

Gap pattern configuration with id #1 as specified in Table 8.1.2.1-1 is provided. In the measurement control information it is indicated to the UE that periodic reporting of the UTRA TDD P-CCPCH RSRP measurement is used.

A.9.5.2.2 Test parameters

In this set of test cases there are two cells. Cell 1 is a E-UTRA TDD cell and cell 2 is a UTRA TDD cell. The absolute accuracy of P-CCPCH RSCP measurements are tested by using test parameters in Table A.9.5.2-1, Table A.9.5.2-2, and Table A.9.5.2-3. In all test cases, Cell 1 is the serving cell and Cell 2 is the target cell.

Table A.9.5.2-1: General test parameters for UTRA TDD P-CCPCH RSCP measurement

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
E-UTRAN RF Channel Number		1	One E-UTRAN TDD carrier frequency is used.
UTRAN RF Channel Number		2	One UTRAN TDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BWchannel)	MHz	10	
Active cell		Cell 1	E-UTRA TDD cell1 on RF channel number 1
Neighbour cell		Cell 2	1.28Mcps UTRA TDD Cell2 on RF channel number 2
Gap Pattern Id		1	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	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells	ms	3	Asynchronous cells
Inter-RAT (UTRAN TDD) measurement quantity		P-CCPCH RSCP	

Table A.9.5.2-2: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 1)

Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number			1	
BWchannel	MHz		10	
OCNG Patterns defined in A.3.2.2.1 (OP.1		(OP.1 TDD	١
TDD)		,	JF.1 1DL	<u>, </u>
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB	0		
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA ^{Note1}				
OCNG_RB ^{Note1}				
$N_{oc}^{ m Note2}$	dBm/15 kHz		-98	
\hat{E}_s / I_{ot}	dB		4	
RSRP ^{Note3}	dBm/15 kHz		-94	
Io ^{Note3}	dBm/9 MHz		-64.76	
\hat{E}_s / N_{oc}	dB		4	
Propagation condition	-		AWGN	

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

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

Note 3: RSRP and lo 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 A.9.5.2-3: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 2)

Parameter	Unit	Test 1		Tes	st 2	Te	st 3
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Char	nnel 2	Char	nel 2	Char	nnel 2
PCCPCH_Ec/lor	dB	-3		-3		-3	
DwPCH_Ec/lor	dB		0		0		0
OCNS_Ec/lor	dB	-3		-3		-3	
loc	dBm/1.28MHz	-54	4.1	-7	5.2	-(97
Îor/loc	dB	2	2		5	(0
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
lo Note1	dBm/1.28MHz	-50		-6	3 9	-(94
Propagation condition				AWGN			

Note 1: PCCPCH RSCP and lo levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.

Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for the primary frequency in this test.

A.9.5.2.3 Test Requirements

The UTRA TDD P-CCPCH RSCP measurement accuracy shall meet the requirements in section 9.3.1.

A.9.6 GSM Carrier RSSI

A.9.6.1 E-UTRAN FDD

A.9.6.1.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits when the active cell is E-UTRAN FDD. This test will verify the requirements in section 9.4.1. There are 12 different test setups with different signal levels for the GSM cells.

Measurement gaps are configured to measure on the GSM cells. Table A.9.6.1.1-2 defines the cell specific test parameters for the E-UTRAN FDD cell. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement is used. The limits of the GSM test parameters in terms of GSM BCCH received level at the receiver inputs are defined in Table A.9.6.1.1-3.

Table A.9.6.1.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Active cell	-	Cell 1	
DRX	-	OFF	
Gap pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

Table A.9.6.1.1.-2: E-UTRAN FDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN FDD

Parameter	Unit	Tests 1-12
E-UTRAN RF Channel Number		1
BW _{channel}	MHz	10
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)		OP.1 FDD

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	0
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN

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

Table A.9.6.1.1-3: BCCH signal levels at receiver input in dBm

Step	BCCH1	BCCH2	ВССН3	BCCH4	BCCH5	ВССН6
1	-38.5	-38.5	NA	NA	NA	NA
2	-48.5	-48.5	NA	NA	NA	NA
3	-70.5	-70.5	NA	NA	NA	NA
4	-109.5	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

A.9.6.1.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.4.1.

A.9.6.2 E-UTRAN TDD

A.9.6.2.1 Test Purpose and Environment

The purpose of this test is to verify that the GSM Carrier RSSI measurement accuracy is within the specified limits when the active cell is E-UTRAN TDD. This test will verify the requirements in section 9.4.1. There are 12 different test setups with different signal levels for the GSM cells.

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

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

Measurement gaps are configured to measure on the GSM cells. Table A.9.6.2.1-2 defines the cell specific test parameters for the E-UTRAN TDD cell. In the measurement control information it is indicated to the UE that periodic reporting of the GSM RSSI measurement is used. The limits of the GSM test parameters in terms of GSM BCCH received level at the receiver inputs are defined in Table A.9.6.2.1-3.

Table A.9.6.2.1-1: General GSM Carrier RSSI test parameters

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Active cell	-	Cell 1	
DRX	-	OFF	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Gap pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

Table A.9.6.2.1-2: E-UTRAN TDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN TDD

Parameter	Unit	Tests 1 - 12
E-UTRAN RF Channel Number		1
BW _{channel}	MHz	10
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)		OP.1 TDD

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA ^{Note 1}	dB	
OCNG_RB ^{Note 1}	dB	
$N_{oc}^{ m Note~2}$	dBm/15 kHz	-98
RSRP Note 3	dBm/15 kHz	-94
\hat{E}_{s}/I_{ot}	dB	4
SCH_RP Note 3	dBm/15 kHz	-94
\hat{E}_s/N_{oc}	dB	4
Propagation Condition		AWGN
Nata 4. OCNO aball bassadas	(b (a allocated and a constant total toronous (todo according to a constant

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

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over

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

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

Table A.9.6.2.1-3: BCCH signal levels at receiver input in dBm

Step	BCCH1	BCCH2	ВССН3	BCCH4	BCCH5	BCCH6
1	-38.5	-38.5	NA	NA	NA	NA
2	-48.5	-48.5	NA	NA	NA	NA
3	-70.5	-70.5	NA	NA	NA	NA
4	-109.5	-109.5	NA	NA	NA	NA
5	-57.5	NA	-54.5	NA	NA	NA
6	-64.5	NA	-59.5	NA	NA	NA
7	-71.5	NA	NA	-64.5	NA	NA
8	-78.5	NA	NA	-69.5	NA	NA
9	-85.5	NA	NA	NA	-74.5	NA
10	-92.5	NA	NA	NA	-79.5	NA
11	-99.5	NA	NA	NA	NA	-84.5
12	-106.5	NA	NA	NA	NA	-89.5

A.9.6.2.2 Test Requirements

The GSM Carrier RSSI measurement accuracy shall meet the requirements in section 9.4.1.

A.9.7 UE Rx – Tx Time Difference

A.9.7.1 E-UTRAN FDD UE Rx – Tx time difference case

A.9.7.1.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN FDD UE Rx - Tx time difference measurement accuracy is within the specified limits in Section 9.1.9.

There is only one active cell in the test. The tested UE is connected with the serving cell, configured to transmit SRS signals periodically, and signaled to report UE Rx-Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx-Tx measurement reported by the UE.

A.9.7.1.2 Test parameters

The parameters for this test case are defined in Table A.9.7.1.2-1, and the SRS configuration used is defined in Table A.9.7.1.2-2.

Table A.9.7.1.2-1: FDD UE Rx – Tx time difference test parameters

Parameter	Unit	Test 1	Test 2
E-UTRAN RF Channel Number		1	1
BW _{channel}	MHz	1.4	10
DRX		0	FF
PDSCH Reference measurement channel defined in A.3.1.1.1		R.2 FDD	R.0 FDD
PDSCH allocation	n_{PRB}	2—3	13—36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1		R.8 FDD	R.6 FDD
OCNG Patterns defined in A.3.2.1.4(OP.4 FDD) and A.3.2.1.2(OP.2 FDD)		OP.4 FDD	OP.2 FDD
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 ^{Note1}	dB		
OCNG_RB ^{Note1}	dB		
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98	-98
RSRP Note3	dBm/15 kHz	-101	-101
\hat{E}_s/N_{oc}	dB	-3	-3
lo Note3	dBm/1.08 MHz	-77.66	N/A
	dBm/9 MHz	N/A	-68.45
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	-3	-3
Propagation Condition			'GN
Note 1: OCNG shall be used such that the resources in the active cell	are fully allocated an	nd a constant to	otal

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

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

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

Table A.9.7.1.2-2: Sounding Reference Symbol Configuration to be used in FDD UE Rx – Tx time difference test

Field	Test 1	Test 2	Comment
Field	Va	lue	Comment
srsBandwidthConfiguration	bw7	bw5	
srsSubframeConfiguration	SC	c1	
ackNackSrsSimultaneousTransmission	FAL	_SE	
srsMaxUpPTS	N.	/A	Not applicable for FDD
srsBandwidth	()	No hopping
srsHoppingBandwidth	hb	w0	
frequencyDomainPosition	()	
Duration	TR	UE	Indefinite duration
Srs-ConfigurationIndex	()	SRS periodicity of 2ms for all
			Tests.
transmissionComb	()	
cyclicShift	CS	0	No cyclic shift
Note: For further information see secti	on 6.3.2 in 3GPF	PTS 36.331.	

A.9.7.1.3 Test Requirements

The UE Rx – Tx time difference measurement accuracy shall fulfill the requirements in Section 9.1.9.

A.9.7.2 E-UTRA TDD

A.9.7.2.1 Test Purpose and Environment

The purpose of this test is to verify that the E-UTRAN TDD UE Rx-Tx time difference measurement accuracy is within the specified limits in section 9.1.9.

There is only one cell in the test. The tested UE is connected with the serving cell, configured to transmit SRS signals periodcally, and signaled to report UE Rx - Tx time difference measurement. The test equipment measures the transmit timing of the UE using the transmitted SRS, and measures the receive timing using the downlink CRS. The test equipment then compares the difference of these two timings to the UE Rx - Tx measurement reported by the UE.

A.9.7.2.2 Test parameters

The parameters for this test case are defined in Table A.9.7.2.2-1, and the SRS configuration used is defined in Table A.9.7.2.2-2.

Table A.9.7.2.2-1: Cell specific test parameters for UE Rx-Tx time difference measurement

Parameter	Unit	Tests 1	Tests 2
E-UTRAN RF Channel Number	-	1	1
BW _{channel}	MHz	1.4	10
Uplink-downlink configuration of cell Note1		1	1
Special subframe configuration of cell Note1		6	6
PDSCH Reference measurement channel defined in A.3.1.1.2	-	R.2 TDD	R.0 TDD
PDSCH allocation	n_{PRB}	2-3	13-36
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2	-	R.8 TDD	R.6 TDD
OCNG Patterns defined in A.3.2.2.4 (OP.4 TDD) and A.3.2.2.2 (OP.2 TDD)	-	OP.4 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 ^{Note2}	dB		
OCNG_RB ^{Note2}	dB		
N_{oc} Note 3	dBm/15 kHz	-98	-98
RSRP Note 4	dBm/15 kHz	-101	-101
\hat{E}_s/N_{oc}	dB	-3	-3
lo Note 4	dBm/1.08 MHz	-77.66	N/A
	dBm/9 MHz	N/A	-68.45
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{\mathrm{ot}}$	dB	-3	-3
Propagation Condition		AW	'GN

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 the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N_{oc} to be fulfilled.

Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table A.9.7.2.2-2: Sounding Reference Symbol Configuration to be used in TDD UE Rx – Tx time difference test

Field	Test 1	Test 2	Comment
Field	Va	lue	Comment
srsBandwidthConfiguration	bw7	bw5	
srsSubframeConfiguration	SC	:1	
ackNackSrsSimultaneousTransmission	FAL	SE	
srsMaxUpPTS	TR	UE	
srsBandwidth	()	No hopping
srsHoppingBandwidth	hb	w0	
frequencyDomainPosition	()	
Duration	TR	UE	Indefinite duration
Srs-ConfigurationIndex	1	0	SRS periodicity of 10ms for all Tests.
transmissionComb	()	
cyclicShift	CS	0	No cyclic shift
Note: For further information see section	on 6.3.2 in 3GPF	TS 36.331.	

A.9.7.2.3 Test Requirements

The UE Rx – Tx time difference measurement accuracy shall fulfill the requirements in section 9.1.9.

A.9.8 RSTD

A.9.8.1 E-UTRAN FDD RSTD intra frequency case

A.9.8.1.1 Test Purpose and Environment

The purpose of this test is to verify that the RSTD intra-frequency measurement accuracy is within the specified limits in section 9.1.10.1 in AWGN channels.

In the test, there are two synchronous cells, Cell 1 as the reference cell and Cell 2 as the neighbour cell on the same frequency.

The test parameters are given in Table A.9.8.1.1-1 and Table A.9.8.1.1-2.

Table A.9.8.1.1-1: General Test Parameters for intra frequency RSTD Tests for E-UTRAN FDD

Parameter	Unit		Value			Comment						
		Test1	Test2	Test3	Test4							
PCFICH/PDCCH/PHICH parameters		R.8	FDD	R.6	FDD	As specified in section A.3.1.2.1						
OCNG Patterns defined in A.3.2.1		OP.7 FDD		OP.7 FDD						OP.6 FDD		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 (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Reference cell		Cell 1										
Neighbour cell		Cell 2										
E-UTRA RF Channel Number		1				One FDD carrier frequency is used.						
Channel Bandwidth (BW _{channel})	MHz		.4	1	0							
PRS Transmission Bandwidth	RB	(3	5	50							
PRS configuration Index I_{PRS}		:	2	2	2	As defined in 3GPP TS 36.211						
Number of consecutive positioning downlink sunbframes N_{PRS}		(6	1		As defined in 3GPP TS 36.211						
prs-MutingInfo				/A		PRS muting is not used. See section 6.5.1.2 in 3GPP TS 36.355 for more information						
Cell ID		(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 =	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 3							
expectedRSTD ^{Note4}	us	3	0	0	-3							
expectedRSTDUncertainty	us	5 5		5	5							
CP length				mal								
DRX			Ol	FF								
Radio frame transmit time difference between cells (cell 2 TX time – cell 1 TX time) Note4			3	us		Synchronous cells						

Table A.9.8.1.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN FDD

Doromotor	l lmi4	Te	st1	Te	st2	Test3		Test4	
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF					1				
Channel Number					'				
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	٩D	0	0	0	_	0	0	0	0
PHICH_RB	dB	U	0	U	0	U	0	0	0
PDCCH_RA									
PDCCH_RB									
OCNG_RA ^{Note1}									
OCNG_RB ^{Note1}									
PRS_RA									
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98	-98	-98	-98	-98	-98	-98	-98
PRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo Note3	dBm/1.08 MHz	-78.92	-78.92	-79.21	-79.21	N/A	N/A	N/A	N/A
	dBm/9 MHz	N/A	N/A	N/A	N/A	-69.72	-69.72	-70	-70
PRP Note3	dBm/15kHz	-100.373	-106.016	-104	-111	-100.373	-106.016	-104	-111
Propagation condition					AW	GN			

- 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 (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
- 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_{ac} to be fulfilled.
- Note 3: Io and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS
- Note 4: The test equipment shall ensure that the receive time difference between the two cells radio frame 0 start at the UE antenna connector is equal to expectedRSTD.

A.9.8.1.2 Test Requirements

The RSTD measurement accuracy shall fulfill the requirements in section 9.1.10.1.

A.9.8.2 E-UTRAN TDD RSTD intra frequency case

A.9.8.2.1 Test Purpose and Environment

The purpose of this test is to verify that the RSTD intra-frequency measurement accuracy is within the specified limits in section 9.1.10.1 in AWGN channels.

In the test, there are two synchronous cells, Cell 1 as the reference cell and Cell 2 as the neighbour cell on the same frequency.

The test parameters are given in Table A.9.8.2.1-1 and Table A.9.8.2.1-2.

Table A.9.8.2.1-1: General Test Parameters for intra frequency RSTD Tests for E-UTRAN TDD

Parameter	Unit	Va		lue		Comment										
		Test1	Test2	Test3	Test4											
PCFICH/PDCCH/PHICH parameters		R.8 TDD		R.6 TDD		As specified in section A.3.1.2.2										
OCNG Patterns defined in A.3.2.2		OP.4 TDD		OP.4 TDD		OP.4 TDD		OP.4 TDD OF		OP.4 TDD		OP.2 TDD		OP.2 TDD		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 (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Reference cell		Cell 1														
Neighbour cell		Cell 2														
E-UTRA RF Channel Number		1				One TDD carrier frequency is used.										
Channel Bandwidth (BW _{channel})	MHz	1.4		10												
Special subframe configuration		6		6		As specified in table 4.2-1 in TS 36.211. The same configuration in both cells.										
Uplink-downlink configuration		3		3 1 36.211 and to The same concells.		1										
PRS configuration Index I_{PRS}		2		2		As defined in 3GPP TS 36.211										
Number of consecutive positioning downlink sunbframes N_{PRS}		6 1		1		As defined in 3GPP TS 36.211										
prs-MutingInfo		N/A				PRS muting is not used. See section 6.5.1.2 in 3GPP TS 36.355 for more information										
Cell ID		(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 1	(Cell ID of cell 1 - Cell ID of cell 2) mod 6 = 0	(Cell ID of cell 1 – Cell ID of cell 2) mod 6 = 3											
expectedRSTD ^{Note4}	us	3	0	0	-3											
expectedRSTDUncertainty	us	5	5	5	5											
CP length		Normal														
DRX		OFF														
Radio frame transmit time difference between cells (cell 2 TX time – cell 1 TX time) Note4		3 us				Synchronous cells										

Table A.9.8.2.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN TDD

Doromotor	l lmit	Te	st1	Te	st2	Test3		Test4	
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF					1				
Channel Number					ı				
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	٩D	0	0	_		0	0	_	_
PHICH_RB	dB	0	0	0	0	0	0	0	0
PDCCH_RA									
PDCCH_RB									
OCNG_RA ^{Note1}									
OCNG_RB ^{Note1}									
PRS_RA									
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98	-98	-98	-98	-98	-98	-98	-98
PRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo Note3	dBm/1.08 MHz	-78.92	-78.92	-79.21	-79.21	N/A	N/A	N/A	N/A
	dBm/9 MHz	N/A	N/A	N/A	N/A	-69.72	-69.72	-70	-70
PRP Note3	dBm/15kHz	-100.373	-106.016	-104	-111	-100.373	-106.016	-104	-111
Propagation condition					AW	GN			

- 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 (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
- 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: Io and PRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Io values are derived in the case that there is no PBCH, PSS or SSS in the OFDM symbols carrying PRS.
- Note 4: The test equipment shall ensure that the receive time difference between the two cells radio frame 0 start at the UE antenna connector is equal to expectedRSTD.

A.9.8.2.2 Test Requirements

The RSTD measurement accuracy shall fulfill the requirements in section 9.1.10.1.

Annex B (informative): Change history:

Change His							
Date	TSG#	TSG Doc.	CR	Rev	Subject	Old	New
2007-12	RP#38	RP-071037			Approved version in TSG RAN#38	-	8.0.0
2008-03	RP#39	RP-080123	2		Updates of TS36.133	8.0.0	8.1.0
2008-05	RP#40	RP-080325	3		Updates of TS36.133	8.1.0	8.2.0
2008-09	RP#41	RP-080644	006	1	E-UTRAN TDD intra frequency measurements when DRX is used	8.2.0	8.3.0
2008-09	RP#41	RP-080644	800	1	E-UTRAN TDD - UTRAN TDD measurements	8.2.0	8.3.0
2008-09	RP#41	RP-080644	012		RSRQ reporting Range	8.2.0	8.3.0
2008-09	RP#41	RP-080644	018	1	Interfrequency and UTRA interRAT DRX peformance requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080644	020	1	Additions to UE transmit timing requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080644	043		Received interference power measurement performance requirement	8.2.0	8.3.0
2008-09	RP#41	RP-080644	044		Cell Synchronization requirement for E-UTRA TDD	8.2.0	8.3.0
2008-09	RP#41	RP-080644	047		Power Headroom Requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080644	048		Event Triggering and Reporting Criteria Capability Requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080642	004		Correction of E-UTRAN to UTRAN TDD handover	8.2.0	8.3.0
2008-09	RP#41	RP-080642	016	1	Definition of Symbols	8.2.0	8.3.0
2008-09	RP#41	RP-080642	019	1	Idle mode requirements updates	8.2.0	8.3.0
2008-09	RP#41	RP-080642	021	1	General updates to 36.133	8.2.0	8.3.0
2008-09	RP#41	RP-080642	023	1	Handover requirements for E-UTRAN to cdma200 HRPD/1x	8.2.0	8.3.0
2008-09	RP#41	RP-080642	024		Inter-frequency and inter-RAT measurement requirements for multiple layer monitoring	8.2.0	8.3.0
2008-09	RP#41	RP-080642	025		Side conditions for UE measurement procedures and measurement performance requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080642	026		Correction to cell reselection Requirement from E-UTRAN to HRPD/cdma200 1x	8.2.0	8.3.0
2008-09	RP#41	RP-080642	027		IRAT Measurement requirements in TS 36.133	8.2.0	8.3.0
2008-09	RP#41	RP-080713	022	1	Corrections to Handover requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	028		Measurement reporting requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	029	2	RRC re-establishment requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	032		Correction to UE measurement requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	033		Correction for the definition of interruption time	8.2.0	8.3.0
2008-09	RP#41	RP-080713	040	1	Correction to idle mode higher priority search requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	045		E-UTRAN TDD inter frequency measurement requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	046		Updates of the Measurement procedures in RRC_Connected state from RAN 4#47bis and RAN 4#48	8.2.0	8.3.0
2008-12	RP#42	RP-080919	53		Introduction of 700MHz Bands 12, 14 and 17	8.3.0	8.4.0
2008-12	RP#42	RP-080928	88	1	CR to 36.133 on Radio Link Failure Monitoring	8.3.0	8.4.0
2008-12	RP#42	RP-080929	51		Correction to idle mode requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080929	52		Definition of out of service area	8.3.0	8.4.0
2008-12	RP#42	RP-080929	54		Measurement requirements for UTRAN TDD cells in idle state	8.3.0	8.4.0
2008-12	RP#42	RP-080929	69	2	Correction of Inter-RAT UTRA cell reselection requirement	8.3.0	8.4.0
2008-12	RP#42	RP-080929	55		Correction of E_UTRAN cell measurement requirements in idle state	8.3.0	8.4.0
2008-12	RP#42	RP-080930	76		Correction to HO Requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080931	71		Random access requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080932	85		Cell phase synchronization error for large cell	8.3.0	8.4.0
2008-12	RP#42	RP-080932	63	4	Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers	8.3.0	8.4.0
2008-12	RP#42	RP-080933	49		E-UTRAN TDD-TDD intra/inter frequency measurement reporting requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	50		E-UTRAN FDD – UTRAN FDD Measurement reporting requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	58		Measurement requirement for E-UTRAN TDD to UTRAN TDD/FDD when DRX is used	8.3.0	8.4.0
2008-12	RP#42	RP-080933	60		Interfrequency and GSM measurement performance requirements in large DRX	8.3.0	8.4.0
2008-12	RP#42	RP-080933	62		Correction of implementation margin for transmission gap.	8.3.0	8.4.0
2008-12	RP#42	RP-080933	72		Alignement of DRX cycle dependent requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	73	1	Alignement of side conditions for mobility measurements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	66	1	Measurement models in RRC_CONNECTED	8.3.0	8.4.0
2008-12	RP#42	RP-080933	78	1	Limitation of maximum number of layers for multiple monitoring	8.3.0	8.4.0

2008-12	RP#42	RP-080933	83	1	GSM Cell identification requirements for parallel monitoring	8.3.0	8.4.0
2008-12	RP#42	RP-080933	87	<u> </u>	UE transmit timing requirement	8.3.0	8.4.0
2008-12	RP#42	RP-080933	56		Correction of TS 36.133 section 8.1.2.1.1.	8.3.0	8.4.0
2008-12	RP#42	RP-080934	77		Correction to RSRQ Report Mapping	8.3.0	8.4.0
2008-12	RP#42	111 000001	86		Missing side conditions for RSRP and RSRQ	8.3.0	8.4.0
2008-12	RP#42	RP-080935	81	1	Phase I RRM Test Cases	8.3.0	8.4.0
2008-12	RP#42		80	1	Test Configuration for RRM Tests: Measurement Reference	8.3.0	8.4.0
2222 12	DD:::10	DD 000000			Channels and OCNG		
2008-12	RP#42	RP-080936	75	ļ <u></u>	Cdma200 1xRTT Measurement Requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080937	74	1	E-UTRA to UTRA cell search requirements for SON	8.3.0	8.4.0
2009-03	RP#43	RP-090182	101	1	Correction of A3-offset parameter in RRM test case	8.4.0	8.5.0
2009-03	RP#43	RP-090182	105		Some Editorial Corrections	8.4.0	8.5.0
2009-03	RP#43	RP-090182	145		Clarifications for the DRX state	8.4.0	8.5.0
2009-03	RP#43	RP-090183	89		Modification on measurements of UTRAN TDD cells	8.4.0	8.5.0
2009-03	RP#43	RP-090183	91		Clarification of the correct behavior when Treselection is not a multiple of idle mode reselection evaluation period	8.4.0	8.5.0
2009-03	RP#43	RP-090183	98		Clarification of 'Out of Service Area' Concept and Definition	8.4.0	8.5.0
2009-03	RP#43	RP-090183	118		Radio link monitoring	8.4.0	8.5.0
2005 05	10 #45	111 050105	110		Radio link monitoring	0.4.0	0.0.0
2009-03	RP#43	RP-090183	142	1	Update of RRC_IDLE state mobility side conditions	8.4.0	8.5.0
2009-03	RP#43	RP-090183	150		UE measurement capability in Idle mode	8.4.0	8.5.0
2009-03	RP#43	RP-090184	133		Removal of RRC re-establishment procedure delay	8.4.0	8.5.0
2009-03	RP#43	RP-090184	138	1	Correction for the UE Re-establishment delay requirement	8.4.0	8.5.0
2009-03	RP#43	RP-090185	92	2	Cell phase synchronization accuracy	8.4.0	8.5.0
2009-03	RP#43	RP-090185	97		Radio link monitoring in DRX	8.4.0	8.5.0
2009-03	RP#43	RP-090185	120		UE Transmit Timing	8.4.0	8.5.0
2009-03	RP#43	RP-090185	137	1	Clarification of the reference point for the UE initial transmission timing control requirement	8.4.0	8.5.0
2009-03	RP#43	RP-090186	90		Correction of section 8.1.2.2.2.2 in TS36.133	8.4.0	8.5.0
2009-03	RP#43	RP-090186	93	1	cdma2000 1xRTT and HRPD Measurement Requirements	8.4.0	8.5.0
2009-03	RP#43	RP-090186	94		Event Triggered Periodic Reporting Requirements for IRAT Measurements	8.4.0	8.5.0
2009-03	RP#43	RP-090186	95		Measurement Reporting Requirements for E-UTRAN TDD – UTRAN TDD Measurements	8.4.0	8.5.0
2009-03	RP#43	RP-090186	99	1	Clarification of UE behavior when measurement gap is used	8.4.0	8.5.0
2009-03	RP#43	RP-090186	100		E-UTRA to UTRA cell search requirements in DRX for SON	8.4.0	8.5.0
2009-03	RP#43	RP-090186	110	1	Correction to GSM BSIC Requirements for Parallel Monitoring	8.4.0	8.5.0
2009-03	RP#43	RP-090186	117		Alignment of terminology for GAP	8.4.0	8.5.0
2009-03	RP#43	RP-090186	134		Inter frequency and Inter RAT cell search requirement when DRX is used	8.4.0	8.5.0
2009-03	RP#43	RP-090186	139		Correction of E-UTRAN FDD – UTRAN FDD measurements when no DRX	8.4.0	8.5.0
2009-03	RP#43	RP-090186	146		Addition of the definition of "when DRX is used"	8.4.0	8.5.0
2009-03	RP#43	RP-090186	147	1	Corrections to E-UTRAN inter-frequency side conditions	8.4.0	8.5.0
2009-03	RP#43	RP-090187	96		Correction to Intra-frequency RSRP Accuracy Requirements	8.4.0	8.5.0
2009-03	RP#43	RP-090187	136	1	Power Headroom reporting delay	8.4.0	8.5.0
2009-03	RP#43	RP-090370	103	1	E-UTRAN -GSM Handover Test Case	8.4.0	8.5.0
2009-03	RP#43	RP-090370	103	1	E-UTRAN FDD - UTRAN TDD Cell Search Test Cases in	8.4.0	8.5.0
2000.02	DD#40	DD 000070	100	1	Fading	0.40	0.5.0
2009-03 2009-03	RP#43 RP#43	RP-090370 RP-090370	106 107	1	E-UTRA FDD to UTRA FDD Handover Test Case Correction of E-UTRA FDD-FDD Intra-frequency cell	8.4.0 8.4.0	8.5.0 8.5.0
	RP#43	RP-090370	108	1	reselection test case Correction of E-UTRA FDD-FDD priority based Inter- frequency cell reselection test case	8.4.0	8.5.0
2009-03							
	RP#43	RP-090370	111			840	850
2009-03 2009-03 2009-03	RP#43 RP#43	RP-090370 RP-090370	111 112	1	E-UTRAN TDD - UTRAN FDD Handover Test Case E-UTRAN FDD - GSM Cell Search Test Case in AWGN	8.4.0 8.4.0	8.5.0 8.5.0

2009-03	RP#43	RP-090370	114	1	E-UTRAN UE Timing Accuracy Related Test Cases	8.4.0	8.5.0
2009-03	RP#43	RP-090370	115	1	Inclusion of MBSFN Configurations for RRM Test Cases	8.4.0	8.5.0
2009-03	RP#43	RP-090370	116		E-UTRAN FDD HRPD Cell Reselection Test Case; HRPD of Low Priority	8.4.0	8.5.0
2009-03	RP#43	RP-090370	122	1	Clarification on Annex A.9: Measurement performance requirements	8.4.0	8.5.0
2009-03	RP#43	RP-090370	125		E-UTRA TDD – UTRA TDD cell reselection: UTRA is of higher priority	8.4.0	8.5.0
2009-03	RP#43	RP-090370	126		E-UTRA TDD – UTRA TDD cell reselection: UTRA is of lower priority	8.4.0	8.5.0
2009-03	RP#43	RP-090370	127		E-UTRA FDD – UTRA TDD cell reselection	8.4.0	8.5.0
2009-03	RP#43	RP-090370	128	1	E-UTRA TDD-UTRA TDD cell search (fading)	8.4.0	8.5.0
2009-03	RP#43	RP-090370	129	1	E-UTRA TDD-UTRA TDD handover	8.4.0	8.5.0
2009-03	RP#43	RP-090370	132	1	Addition of E-UTRA FDD to UTRA FDD reselection test cases	8.4.0	8.5.0
2009-03	RP#43	RP-090370	141	1	Correction and introduction of some test related parameters	8.4.0	8.5.0
2009-03	RP#43	RP-090370	143		Description of Annex A in TS 36.133	8.4.0	8.5.0
2009-03	RP#43	RP-090370	148		Reselection from E-UTRA to GSM cell test case	8.4.0	8.5.0
2009-03	RP#43	RP-090370	149		Radio Link Monitoring Test Cases	8.4.0	8.5.0
2009-05	RP#44	RP-090546	151		E-UTRA FDD UTRA TDD HO delay test case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	153		Correction of CQI reporting periodicity for TDD RLM test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	157		Correction to inter RAT reselection requirements to exclude equal priority. (Technically Endorsed CR in R4-50bis - R4-091092)	8.5.0	8.6.0
2009-05	RP#44	RP-090546	167		Clarification of the number of monitoring carriers in idle mode. (Technically Endorsed CR in R4-50bis - R4-091394)	8.5.0	8.6.0
2009-05	RP#44	RP-090546	180		Correction of Core spec references in A.9 Measurements performance test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	984		UTRA FDD-E-UTRA FDD/ TDD handover test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	184		SON ANR UTRAN FDD Cell Search Test Case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	187		E-UTRAN FDD cdma2000 1x RTT Cell Reselection Test Case; Cdma2000 1X of Low Priority	8.5.0	8.6.0
2009-05	RP#44	RP-090546	188		E-UTRAN FDD cdma2000 HO Test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	190		E-UTRAN Random Access Test Cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	191		E-UTRAN RRC Re-establishment Test Cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	192		E-UTRAN TDD - GSM Cell Search Test Case in AWGN	8.5.0	8.6.0
2009-05	RP#44	RP-090546	197		Correction to E-UTRAN FDD - GSM Handover Test case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	173	1	Correction of cell reselection test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	179	1	Test cases of E-UTRA TDD intra-frequency cell search in fading environment when DRX is used	8.5.0	8.6.0
2009-05	RP#44	RP-090546	152	1	E-UTRA TDD GSM handover test case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	178	1	Test cases of E-UTRA FDD intra-frequency cell search in fading environment when DRX is used	8.5.0	8.6.0
2009-05	RP#44	RP-090546	201	1	Test case for E-UTRA FDD E-UTRA FDD inter frequency cell search when DRX is used in fading conditions	8.5.0	8.6.0
2009-05	RP#44	RP-090546	185	1	Correction to Radio Link Monitoring Tests	8.5.0	8.6.0
2009-05	RP#44	RP-090546	203		Correction to E-UTRAN FDD to HRPD Cell Reselection Test Case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	177	1	Introduction of New Reference Channels and OCNG Patterns for 1.4MHz Bandwidth	8.5.0	8.6.0
2009-05	RP#44	RP-090546	200	2	Test case for E-UTRA TDD E-UTRA TDD inter frequency cell search when DRX is used in fading conditions	8.5.0	8.6.0
2009-05	RP#44	RP-090547	158		Alignment of inter frequency and inter RAT RRM reselection testcases with core requirements. (Technically Endorsed CR in R4-50bis - R4-091094)	8.5.0	8.6.0
2009-05	RP#44	RP-090547	160		Correction relating E-UTRAN TDD - UE Transmit Timing Accuracy Tests. (Technically Endorsed CR in R4-50bis - R4- 091198)	8.5.0	8.6.0
2009-05	RP#44	RP-090547	165		Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386)	8.5.0	8.6.0
2009-05	RP#44	RP-090547	172		E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)	8.5.0	8.6.0
2009-05	RP#44	RP-090547	171	1	Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4- 50bis - R4-091508)	8.5.0	8.6.0
2009-05	RP#44	RP-090548	170		Misalignment between TS36.133 and TS36.321. (Technically Endorsed CR in R4-50bis - R4-091457)	8.5.0	8.6.0
2009-05	RP#44	RP-090548	193		Correction to Inter-RAT HO Interruption Time Definition	8.5.0	8.6.0
2009-05	RP#44	RP-090548	195		CR c2k RRC delay	8.5.0	8.6.0
2009-05	RP#44	RP-090548	196		CR c2k interruption time	8.5.0	8.6.0
2009-05	RP#44	RP-090548	162		Clarifications to UE UL timing requirements. (Technically Endorsed CR in R4-50bis - R4-091357)	8.5.0	8.6.0
2009-05	RP#44	RP-090548	176		Corrections of Random Access Requirements	8.5.0	8.6.0
2009-05	RP#44	RP-090548	154	I	Correction of TGRP in clause 8.1.2.1.1	8.5.0	8.6.0

2009-05	RP#44	RP-090548	168		Clarifications for the Relative RSRP and RSRQ measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091407)	8.5.0	8.6.0
2009-05	RP#44	RP-090549	161		E-UTRAN UTRAN HO Command Processing Delay. (Technically Endorsed CR in R4-50bis - R4-091291)	8.5.0	8.6.0
2009-05	RP#44	RP-090549	175		Corrections of Cell Reselection Requirements in Idle Mode	8.5.0	8.6.0
2009-05	RP#44	RP-090549	181	2	Removal of [] from ranking criteria in Idle mode cell reselection	8.5.0	8.6.0
2009-05	RP#44	RP-090550	156		Correction on the TDD-TDD inter frequency measurements. (Technically Endorsed CR in R4-50bis - R4-091071)	8.5.0	8.6.0
2009-05	RP#44	RP-090550	159		Correction to the Referenced Section Number for Tinter1. (Technically Endorsed CR in R4-50bis - R4-091153)	8.5.0	8.6.0
2009-05	RP#44	RP-090551	166		Further clarification of DRX/Non-DRX state. (Technically Endorsed CR in R4-50bis - R4-091389)	8.5.0	8.6.0
2009-05	RP#44	RP-090551	202		Correction on reference to 3GPP2 specification	8.5.0	8.6.0
2009-05	RP#44	RP-090551	169		OCNG simplification. (Technically Endorsed CR in R4-50bis - R4-091410)	8.5.0	8.6.0
2009-05	RP#44	RP-090559	155		Introduction of Extended LTE800 requirements. (Technically Endorsed CR in R4-50bis - R4-091063)	8.6.0	9.0.0
2009-05	RP#45	RP-090817	211		Correction to TDD RMC references in RLM test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	205		Introduction of Reference DRX configurations	9.0.0	9.1.0
2009-05	RP#45	RP-090880	207		Addition of DRX configurations into non DRX test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	225		Correction to HO Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	227		Correction to E-UTRAN GSM BSIC Identification Requirements with DRX	9.0.0	9.1.0
2009-05	RP#45	RP-090880	259		Corrections of Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	314		E-UTRA FDD - E-UTRA FDD and UTRA FDD cell search test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	315		E-UTRAN Radio Link Monitoring Test Cases in DRX	9.0.0	9.1.0
2009-05	RP#45	RP-090880	316		Inter-frequency E-UTRA - E-UTRA HO test cases: unknown target cell	9.0.0	9.1.0
2009-05	RP#45	RP-090880	263	2	E-UTRA FDD UTRA FDD Blind Handover test case: unknown target cell	9.0.0	9.1.0
2009-05	RP#45	RP-090836	321	1	Small corrections to Measurements performance tests parameters	9.0.0	9.1.0
2009-05	RP#45	RP-090836	285	1	E-UTRAN GSM Cell Search in DRX Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	267		Set 3.2. E-UTRA TDD to UTRA TDD cell search in DRX under fading	9.0.0	9.1.0
2009-05	RP#45	RP-090836	269		Set 3.6. Test case of E-UTRA TDD to E-UTRA TDD and UTRA TDD combined cell search under fading	9.0.0	9.1.0
2009-05	RP#45	RP-090836	271		Set 3.12. E-UTRA TDD to UTRA TDD blind handover test	9.0.0	9.1.0
2009-05	RP#45	RP-090836	279		E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	281		E-UTRAN TDD- E-UTRAN TDD and E-UTRAN TDD Inter- frequency Cell Search Test Case	9.0.0	9.1.0
2009-05	RP#45	RP-090836	283		E-UTRAN GSM Blind Handover Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	287		RRM Test case for multiple E-UTRAN FDD-FDD Inter-	9.0.0	9.1.0
2009-05	RP#45	RP-090836	302		frequency event triggered reporting under fading propagation conditions	9.0.0	9.1.0
2009-05	RP#45	RP-090836	304		Fading reselection test case between E-UTRA and UTRA (UTRA of lower priority	9.0.0	9.1.0
2009-05	RP#45	RP-090828	233		CR SI HRPD correction	9.0.0	9.1.0
2009-05	RP#45	RP-090879	215	1	Corrections to Measurements of HRPD cells and cdma2000 1X	9.0.0	9.1.0
2009-05	RP#45	RP-090879	231		CR reference correction	9.0.0	9.1.0
2009-05	RP#45	RP-090879	235	1	Corrections to Measurements of GSM cells in RRC_IDLE	9.0.0	9.1.0
2009-05	RP#45	RP-090879	247		Range of Idle Mode Es/lot side conditions	9.0.0	9.1.0
2009-05 2009-05	RP#45 RP#45	RP-090879 RP-090879	249 245	1	Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle	9.0.0	9.1.0
∠∪∪9-05	KF#45	KE-0908/9	245	'	mode	9.0.0	9.1.0
2000 05	DD#4E	DD 000070	247			0.00	0 4 0
2009-05	RP#45	RP-090879	317		CR Idle mode IF measurement condition	9.0.0	9.1.0
2009-05 2009-05 2009-05	RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090879	317 318 217	2	CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility	9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0
2009-05 2009-05	RP#45 RP#45	RP-090879 RP-090879	318 217		CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements	9.0.0	9.1.0 9.1.0
2009-05	RP#45	RP-090879	318	2	CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell	9.0.0	9.1.0
2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090814 RP-090816	318 217 265 221		CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used	9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090814 RP-090816	318 217 265 221 223		CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used E-UTRAN inter RAT measurement requirements	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090814 RP-090816	318 217 265 221		CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used E-UTRAN inter RAT measurement requirements Correction to Monitoring of Multiple Layers Using Gaps E-UTRAN FDD-FDD inter frequency measurements when	9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090814 RP-090816 RP-090816 RP-090816	318 217 265 221 223 229	1	CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used E-UTRAN inter RAT measurement requirements Correction to Monitoring of Multiple Layers Using Gaps	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0

2009-05	RP#45	RP-090816	213	1	Editorial correction on E-UTRAN inter frequency measurements	9.0.0	9.1.0
2009-05	RP#45	RP-090816	261	1	E-UTRAN TDD intra frequency measurements	9.0.0	9.1.0
2009-05	RP#45	RP-090816	319	1	Clarification of the number of monitoring cells for intra frequency measurements	9.0.0	9.1.0
2009-05	RP#45	RP-090815	237		Correction of timing advance adjustment accuracy test case	9.0.0	9.1.0
2009-05	RP#45	RP-090815	291		Correction to UE Transmit Timing Requirements	9.0.0	9.1.0
2009-12	RP-46	RP-091275	329		Defining requirements for UTRA TDD measurements for SON (Technically endorsed at RAN 4 52bis in R4-093512)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093552)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	333		Modification of test case of E-UTRA TDD inter frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093553)	9.1.0	9.2.0
2009-12	RP-46	RP-091286	334		Introduction of Extended LTE1500 requirements for TS36.133 (Technically endorsed at RAN 4 52bis in R4-093636)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	336		Addition of E-UTRA TDD to UTRA FDD reselection test cases (Technically endorsed at RAN 4 52bis in R4-093686)	9.1.0	9.2.0
2009-12	RP-46	RP-091271	338		Correction of missing accuracy requirements for UTRAN FDD (Technically endorsed at RAN 4 52bis in R4-093689)	9.1.0	9.2.0
2009-12	RP-46	RP-091275	340		CR cdma2000 HRPD measurement period (Technically endorsed at RAN 4 52bis in R4-093720)	9.1.0	9.2.0
2009-12	RP-46	RP-091275	342		CR cdma2000 1x measurement period (Technically endorsed at RAN 4 52bis in R4-093721)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	344		Correction for E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases (Technically endorsed at RAN 4 52bis in R4-093890)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	346		Revise geometry factors for Intra freq Reselection Test Cases	9.1.0	9.2.0
2009-12	RP-46	RP-091271	348		Corrections on RRM parameters for Bands 12, 14, 17	9.1.0	9.2.0
2009-12	RP-46	RP-091271	351	1	Corrections to PDSCH RMC-s	9.1.0	9.2.0
2009-12	RP-46	RP-091271	353		Corrections of TS36.133	9.1.0	9.2.0
2009-12	RP-46	RP-091275	356	1	UTRA TDD P-CCPCH RSCP absolute accuracy measurement in E-UTRAN	9.1.0	9.2.0
2009-12	RP-46	RP-091275	358	1	E-UTRAN TDD - UTRAN TDD cell search for SON	9.1.0	9.2.0
2009-12	RP-46	RP-091275	361		Cell Search Requirements for Intra-LTE Handover to Unknown Target Cell	9.1.0	9.2.0
2009-12	RP-46	RP-091273	365		Combined E-UTRAN interfrequency and GSM cell search test cases (Scenario set 3.2)	9.1.0	9.2.0
2009-12	RP-46	RP-091271	367	1	Correction in UE UTRA TDD P-CCPCH RSCP measurement capability for R9	9.1.0	9.2.0
2009-12	RP-46	RP-091273	374		E-UTRAN GSM RSSI Measurement Accuracy Tests	9.1.0	9.2.0
2009-12	RP-46	RP-091273	375		E-UTRAN UTRAN FDD CPICH RSCP Measurement Accuracy Tests	9.1.0	9.2.0
2009-12	RP-46	RP-091273	376		E-UTRAN UTRAN FDD CPICH Ec/No Measurement Accuracy Tests	9.1.0	9.2.0
2009-12	RP-46	RP-091275	378		Cell Timing Change Requirements for Event Triggered Reporting	9.1.0	9.2.0
2009-12	RP-46	RP-091271	380		Correction to Power Headroom Requirements	9.1.0	9.2.0
2009-12	RP-46	RP-091271	382		Editorial corrections to 36.133	9.1.0	9.2.0
2009-12	RP-46	RP-091271	387		Editorial corrections to the time units for RRC Re- establishment test cases	9.1.0	9.2.0
2009-12	RP-46	RP-091272	389	1	Introduction of cell search test case in DRX to verify L3 filtering	9.1.0	9.2.0
2009-12	RP-46	RP-091271	391		Correction to ONCG Patterns	9.1.0	9.2.0
2009-12	RP-46	RP-091275	329		Defining requirements for UTRA TDD measurements for SON (Technically endorsed at RAN 4 52bis in R4-093512)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093552)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	333		Modification of test case of E-UTRA TDD inter frequency cell reselection (Technically endorsed at RAN 4 52bis in R4-093553)	9.1.0	9.2.0
2010-03	RP-47	RP-100254	410		Idle mode corrections	9.2.0	9.3.0
2010-03	RP-47	RP-100254	405	1	UE measurement capability requirements in Idle and Connected	9.2.0	9.3.0
2010-03	RP-47	RP-100254	423		Correction to UE Measurement Capability Requirements in Idle Mode	9.2.0	9.3.0
2010-03	RP-47	RP-100254	412		Removal of activation time from interRAT handover requirements	9.2.0	9.3.0
2010-03	RP-47	RP-100254	417	1	Correction to UE Transmit Timing Requirements	9.2.0	9.3.0
2010-03	RP-47			1		9.2.0	
∠∪10-03	KF-4/	RP-100254	402	I	Correction of E-UTRAN TDD inter frequency	ყ.∠.∪	9.3.0

					measurements_R9		
2010-03	RP-47	RP-100254	414	1	Enhanced GSM Requirements for CSFB	9.2.0	9.3.0
2010-03	RP-47	RP-100254	415	1	Enhanced UTRA FDD Requirements for CSFB	9.2.0	9.3.0
2010-03	RP-47	RP-100255	399		Correction of RSRP value in E-UTRAN FDDFDD Inter	9.2.0	9.3.0
					frequency reselection test		
2010-03	RP-47	RP-100255	397		Addition of missing Es/Noc parameters in RRM test	9.2.0	9.3.0
					cases		
2010-03	RP-47	RP-100255	421		Correction to RRC Re-establishment Test Case	9.2.0	9.3.0
2010-03	RP-47	RP-100255	427	1	Correction of UE transmit timing test case	9.2.0	9.3.0
2010-03	RP-47	RP-100255	419	1	Correction to RLM Test Cases	9.2.0	9.3.0
2010-03	RP-47	RP-100262	407	-	Editorial Corrections in TS36.133(Rel-9)	9.2.0	9.3.0
2010-03	RP-47	RP-100263	413			9.2.0	9.3.0
2010-03	IXF -41	KF-100203	413		Introduction of LTE in 800 MHz for Europe	9.2.0	9.3.0
2010-03	RP-47	RP-100264	395		requirements in TS 36.133	9.2.0	9.3.0
2010-03	IXF-41	KF-100204	395		Corrections for Extended UMTS1500 in TS36.133(Rel-	9.2.0	9.3.0
2010-03	RP-47	RP-100269	200		9)	9.2.0	9.3.0
			393		AOA and TA measurement report mappings		
2010-03	RP-47	RP-100269	403	2	Mapping of UE RxTx time difference measurement	9.2.0	9.3.0
2010-03	RP-47	RP-100266	425	2	Home eNode B synchronization requirement	9.2.0	9.3.0
2010-03	RP-47	RP-100266	424		Minimum requirements on SI reading for HeNB	9.2.0	9.3.0
				2	inbound mobility		
2010-06	RP-48	RP-100622	473		Clarification on radio link monitoring	9.3.0	9.4.0
2010-06					Corrections of section numbering on the test case of E-	9.3.0	9.4.0
	RP-48	RP-100622	470		UTRAN FDD-FDD inter-frequency cell search requirements		
2010-06	RP-48	RP-100622	472 466	1	for L3 fitering Correction to RRM Test Cases	9.3.0	9.4.0
2010-06	RP-48	RP-100622	464	'	Correction to RRM Requirements	9.3.0	9.4.0
2010-06	RP-48	RP-100622	462	1	Correction to Absolute RSRP/RSRQ Definitions	9.3.0	9.4.0
2010-06	RP-48	RP-100622	457	<u> </u>	UE Measurement Capability Requirements for CDMA2000	9.3.0	9.4.0
2010-06	10	111 100022			Correction of E-UTRAN Inter-frequency Cell Re-selection	9.3.0	9.4.0
	RP-48	RP-100622	455	1	Requirements		
2010-06	RP-48	RP-100622	451	1	Correction to idle mode requirements(Rel-9)	9.3.0	9.4.0
2010-06	RP-48	RP-100622	449	1	Editorial corrections to 36.133(Rel-9)	9.3.0	9.4.0
2010-06	RP-48	RP-100622	447		Correction to TDD intrafrequency accuracy test case	9.3.0	9.4.0
2010-06					Correction of Io value in E-UTRAN FDD and TDD Inter	9.3.0	9.4.0
	RP-48	RP-100622	441	1	frequency RSRP tests		
2010-06	RP-48	RP-100627	444	2	Corrections to CSG SI reading core requirement	9.3.0	9.4.0
2010-06	RP-48	RP-100627	445	1	RSRQ idle mode requirements	9.3.0	9.4.0
2010-06 2010-06	RP-48 RP-48	RP-100630	470 460	1	Test cases for R9 cell reselection enhancements	9.3.0	9.4.0
2010-06	RP-48	RP-100630 RP-100631	442	2	Missing E-UTRA - UTRA FDD DRX Requirements Corrections to enhanced cell identification core requirement	9.3.0 9.3.0	9.4.0
2010-06	KF-40	KF-100031	442		Applicability of mobility requirements with inter-frequency	9.3.0	9.4.0
2010 00	RP-48	RP-100632	469		RSTD measurements	3.3.0	3.4.0
2010-06	111 10	111 100002	100		UE Rx-Tx Time Difference Measurement Requirements for	9.3.0	9.4.0
	RP-48	RP-100632	439		E-CID		
2010-06	RP-48	RP-100632	438	2	CR UE RX-TX time-difference measurement requirement	9.3.0	9.4.0
2010-06	RP-48	RP-100632	433	5	RSTD Measurement Requirements for OTDOA	9.3.0	9.4.0
2010-06	RP-48	RP-100632	432	5	RSTD Accuracy Requirements for OTDOA	9.3.0	9.4.0
2010-09	RP-49	RP-100914	477	1	Cell identity change time in RRM Test cases	9.4.0	9.5.0
2010-09	RP-49	DD 400040	E27		A clarification text in the RSTD intra-frequency accuracy		9.5.0
		RP-100919	537			9.4.0	9.5.0
2040.00	DD 40				requirements		
2010-09	RP-49	RP-100920	506		requirements Correction of drx-RetransmissionTimer parameters	9.4.0	9.5.0
2010-09 2010-09	RP-49 RP-49				requirements Correction of drx-RetransmissionTimer parameters Correction of Io value in RSRP FDD and TDD Intra frequency		
2010-09	RP-49	RP-100920 RP-100915	506 508	1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test	9.4.0 9.4.0	9.5.0 9.5.0
2010-09	RP-49 RP-49	RP-100920 RP-100915 RP-100920	506 508 521	1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9)	9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914	506 508 521 523	1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9)	9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0
2010-09	RP-49 RP-49 RP-49	RP-100920 RP-100915 RP-100920	506 508 521		requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9)	9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920	506 508 521 523 525	1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9)	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920	506 508 521 523 525 505 528	1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920	506 508 521 523 525 505 528 538	1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919	506 508 521 523 525 505 528 538 539	1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919	506 508 521 523 525 505 528 538 539 540	1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919	506 508 521 523 525 505 528 538 539	1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100919	506 508 521 523 525 505 528 538 539 540 544	1 1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919	506 508 521 523 525 505 528 538 539 540	1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100920 RP-100920	506 508 521 523 525 505 528 538 539 540 544	1 1 1 1 1 1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100920 RP-100920 RP-100920	506 508 521 523 525 505 528 538 539 540 544 547	1 1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case Scrambling code change time in RRM Test cases	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100920 RP-100920 RP-100920 RP-100920	506 508 521 523 525 505 528 538 539 540 544 547	1 1 1 1 1 1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case Scrambling code change time in RRM Test cases Introduction of CSG cell reselection requirements	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100920 RP-100920 RP-100920 RP-100920 RP-100920	506 508 521 523 525 505 528 538 539 540 544 547 479 549	1 1 1 1 1 1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case Scrambling code change time in RRM Test cases Introduction of CSG cell reselection requirements correction of redundant Hysteresis(Hys) for 36.133(R9)	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09 2010-09	RP-49	RP-100920 RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100920 RP-100920 RP-100920 RP-100920	506 508 521 523 525 505 528 538 539 540 544 547	1 1 1 1 1 1 1 1 1	requirements Correction of drx-RetransmissionTimer parameters Correction of lo value in RSRP FDD and TDD Intra frequency test Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Correction of Time to Trigger unit for 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case Correction to Enhanced BSIC Verification Requirements Enhanced CSFB Requirements with DRX Correction to E-CID Requirements Addition of UTRA and GSM enhanced cell identification test cases E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case Scrambling code change time in RRM Test cases Introduction of CSG cell reselection requirements	9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0 9.5.0

					L3 filtering is used in R9		
2010-09	RP-49	RP-100915	487		E-UTRA TDD - UTRA TDD cell reselection in fading	9.4.0	9.5.0
					propagation conditions: UTRA TDD is of lower priority in R9		
2010-09	RP-49	RP-100924	492		Test case for E-UTRAN TDD in the existence of non-allowed CSG cell	9.4.0	9.5.0
2010-09	RP-49	RP-100915	494		PDCCH Aggregation level for RRM tests	9.4.0	9.5.0
2010-09	RP-49	RP-100915	503		Correction of ES/lot value in E-UTRAN RSRQ FDD intra frequency test	9.4.0	9.5.0
2010-09	RP-49	RP-100915	496		Corrections to RRM OCNG Patterns	9.4.0	9.5.0
2010-09	RP-49	RP-100919	498		RRC timer accuracy requirement	9.4.0	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.4.0	9.5.0
2010-09	RP-49	RP-100914	477	1	Cell identity change time in RRM Test cases	9.4.0	9.5.0
2010-09	RP-49	RP-100919	537		A clarification text in the RSTD intra-frequency accuracy requirements	9.4.0	9.5.0
2010-09	RP-49	RP-100920	506		Correction of drx-RetransmissionTimer parameters	9.4.0	9.5.0
2010-09	RP-49	RP-100915	508		Correction of lo value in RSRP FDD and TDD Intra frequency test	9.4.0	9.5.0
2010-09	RP-49	RP-100920	521	1	Editorial corrections to 36.133 (R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100914	523		Alignment of REFSENS between 36.101 and 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	525	1	Correction of Time to Trigger unit for 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100915	505	1	Corrections to 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	528	1	E-UTRAN FDD Intra Frequency RSTD Measurement Accuracy test case	9.4.0	9.5.0
2010-09	RP-49	RP-100919	538	1	Correction to Enhanced BSIC Verification Requirements	9.4.0	9.5.0
2010-09	RP-49	RP-100919	539		Enhanced CSFB Requirements with DRX	9.4.0	9.5.0
2010-09	RP-49	RP-100919	540		Correction to E-CID Requirements	9.4.0	9.5.0
2010-09	RP-49	RP-100920	544	1	Addition of UTRA and GSM enhanced cell identification test cases	9.4.0	9.5.0
2010-09	RP-49	RP-100920	547	1	E-UTRAN FDD UE Rx – Tx Time Difference Measurement Accuracy test case	9.4.0	9.5.0
2010-09	RP-49	RP-100914	479	1	Scrambling code change time in RRM Test cases	9.4.0	9.5.0
2010-09	RP-49	RP-100914	549		Introduction of CSG cell reselection requirements	9.4.0	9.5.0
2010-09	RP-49	RP-100920	527		correction of redundant Hysteresis(Hys) for 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	488	2	Test case for TDD UE Rx-Tx time difference measurement	9.4.0	9.5.0
2010-09	RP-49	RP-100914	483		Clarification of Radio link monitoring test cases	9.4.0	9.5.0
2010-09	RP-49	RP-100915	485		Test case for E-UTRA TDD event triggered reporting when L3 filtering is used in R9	9.4.0	9.5.0
2010-09	RP-49	RP-100915	487		E-UTRA TDD - UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is of lower priority in R9	9.4.0	9.5.0
2010-09	RP-49	RP-100924	492		Test case for E-UTRAN TDD in the existence of non-allowed CSG cell	9.4.0	9.5.0
2010-09	RP-49	RP-100915	494		PDCCH Aggregation level for RRM tests	9.4.0	9.5.0
2010-09	RP-49	RP-100915	503		Correction of ES/lot value in E-UTRAN RSRQ FDD intra frequency test	9.4.0	9.5.0
2010-09	RP-49	RP-100915	496		Corrections to RRM OCNG Patterns	9.4.0	9.5.0
2010-09	RP-49	RP-100919	498		RRC timer accuracy requirement	9.4.0	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.4.0	9.5.0
2010-09	RP-49	RP-100927	497		CR LTE_TDD_2600_US spectrum band definition additions to TS 36.133	9.5.0	10.0.0

2010-12	RP-50	RP-101331	635	1	Corrections to 36.133 performance requirements	10.0.0	10.1.0
2010-12	RP-50	RP-101331	638		Corrections to 30:133 performance requirements Correction to intra frequency cell identification time for FDD	10.0.0	10.1.0
					and TDD		
2010-12	RP-50	RP-101331	566	1	Corrections and Clarifications to TS36.133	10.0.0	10.1.0
2010-12	RP-50	RP-101331	592	2	Correction to Radio link monitoring test cases	10.0.0	10.1.0
2010-12	RP-50	RP-101332	563		PDCCH Aggregation Level for RRM Tests	10.0.0	10.1.0
2010-12	RP-50	RP-101332	571		MIMO correlation scenario for RLM test cases	10.0.0	10.1.0
2010-12	RP-50	RP-101332	580		Removal of [] from PDSCH and PCFICH/PDCCH/PHICH Measurement Channel references in Annex A.	10.0.0	10.1.0
2010-12	RP-50	RP-101332	585		Enabling HARQ for RRM Tests	10.0.0	10.1.0
2010-12	RP-50	RP-101335	643	1	Completion of CSG cell reselection requirements	10.0.0	10.1.0
2010-12	RP-50	RP-101343	568		Clarification of measurements requirements for HRPD and cdma2000 1x	10.0.0	10.1.0
2010-12	RP-50	RP-101343	589		Addition of Band 18, 19 and 21 into UE Rx - Tx time difference requirements	10.0.0	10.1.0
2010-12	RP-50	RP-101343	604		Correction to Enhanced GSM Cell Identification Requirement	10.0.0	10.1.0
2010-12	RP-50	RP-101343	632		Correction of reselection requirement for UTRAN FDD cells	10.0.0	10.1.0
2010-12	RP-50	RP-101343	640		Correction to Enhanced UTRA FDD Cell Identification	10.0.0	10.1.0
					Requirements		
2010-12	RP-50	RP-101343	645		E-UTRAN TDD Intra Frequency RSTD Measurement Accuracy test case	10.0.0	10.1.0
2010-12	RP-50	RP-101343	621	1	Correction for Measurements of inter-RAT cells	10.0.0	10.1.0
2010-12	RP-50	RP-101343	598	2	E-UTRAN FDD intra-frequency RSTD measurement reporting delay test case	10.0.0	10.1.0
2010-12	RP-50	RP-101343	600	2	E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case	10.0.0	10.1.0
2010-12	RP-50	RP-101356	644		Band 42 and 43 parameters for UMTS/LTE 3500 (TDD) for TS 36.133	10.0.0	10.1.0
2010-12	RP-50	RP-101361	552		Introduction of L-band in TS36.133	10.0.0	10.1.0
2010-12	RP-50	RP-101388	648		Removal of square brackets from scope of TS36.133	10.0.0	10.1.0
2011-11	RP-51	RP-110359	0658	-	Addition of UE RRM capabilities for CA	10.1.0	10.2.0
2011-11	RP-51	RP-110340	0663	-	Correction to E-UTRAN TDD in-sync test requirements	10.1.0	10.2.0
2011-11	RP-51	RP-110348	0665	1	RSTD requirements, RMC and OCNG patterns	10.1.0	10.2.0
2011-11	RP-51	RP-110350	0669	-	CR to 36.133: Aligning relavant RRM requirements for Band 41 with the reference sensitivity values in 36.101	10.1.0	10.2.0
2011-11	RP-51	RP-110339	0676	-	Modification on test case of E-UTRA TDD to UTRA TDD cell reselection(R10)	10.1.0	10.2.0
2011-11	RP-51	RP-110339	0681	1	Value of MS_TXPWR_MAX_CCH for EUTRA-GSM reselection test cases A.4.4.x	10.1.0	10.2.0
2011-11	RP-51	RP-110339	0687	1	Rearrangement of Time periods for EUTRA-UTRA reselection test case A.4.3.1.1	10.1.0	10.2.0
2011-11	RP-51	RP-110339	0690	1	Removal of "Force to Cell 2" during initialisation for EUTRA- UTRA reselection test case A.4.3.1.2	10.1.0	10.2.0
2011-11	RP-51	RP-110340	0693	1	SNR for RRM A.8.x test cases using ETU70	10.1.0	10.2.0
2011-11	RP-51	RP-110408	0697	1	Requirements for Minimaztion of Drive Tests (MDT) in LTE	10.1.0	
2011-11	RP-51	RP-110339	0703	-	Correction to test cases of E-UTRA to UTRA cell reselection when UE is in idle state	10.1.0	10.2.0
2011-11	RP-51	RP-110359	0706	2	Introduction of measurement requirements for carrier aggregation	10.1.0	10.2.0
2011-11	RP-51	RP-110347	0709	1	Addition of test cases for FDD intra-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel-	10.1.0	10.2.0
2011-11	RP-51	RP-110347	0711	1	10 Addition of test cases for FDD inter-frequency SI reading	10.1.0	10.2.0
					using autonomous gaps with both non DRX and DRX for Rel-		
2011-11	RP-51	RP-110359	0713	1	Introduction of core requirements of radio link monitoring in CA	10.1.0	10.2.0
2011-11	RP-51	RP-110339	0719	1	Modification on Test Requirements in E-UTRA - UTRA TDD SON Test Case (A.8.7.3) (R10)	10.1.0	10.2.0
2011-11	RP-51	RP-110348	0727	2	Requirements for reporting criteria with positioning measurements	10.1.0	10.2.0
2011-11	RP-51	RP-110340	0736	-	Correction of RLM evaluation period in DRX	10.1.0	10.2.0
2011-11	RP-51	RP-110340	0739	-	Correction of inter-frequency measurement accuracy test cases	10.1.0	10.2.0
2011-11	RP-51	RP-110339	0744	-	Modification on Test Requirements in E-UTRA GSM cell reselection Test Case (A.4.4) (R10)	10.1.0	10.2.0
2011-11	RP-51	RP-110348	0747	1	Corrections to RSTD measurement for Rel-9	10.1.0	10.2.0
2011-11	RP-51	RP-110348	0748	-	Correction on FDD Intra Frequency RSTD Measurement Accuracy test case	10.1.0	10.2.0
2011-11	RP-51	RP-110348	0751	1	RSTD test case corrections	10.1.0	10.2.0
2011-11	RP-51	RP-110344	0753	-	Correction of serving cell performance requirements for autonomous SI acquisition	10.1.0	10.2.0
			1		L autonomous or acquisition		1

History

Document history					
V10.1.0	January 2011	Publication			
V10.2.0	May 2011	Publication			